Alberta Competitiveness Council

Report on Competitiveness: Alberta 2010

Prepared with assistance from:

MMK CONSULTING

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Message from the Co-Chairs

Honourable Ed Stelmach

Premier

Bob Brawn

Chair, Alberta Economic Development Authority

On behalf of the Alberta Competitiveness Council, we are pleased to present Alberta's inaugural annual Report on Competitiveness.

Improving Alberta's competitiveness is vital for continued success in the world market. For the province to retain its competitive edge, all players – government, industry, academic institutions, labour and all Albertans – must be involved. The conditions for success include competitive taxes, responsible fiscal policy, and an effective regulatory environment.

Through innovation and increased productivity, Albertans will continue to enjoy a high standard of living.

Report on Competitiveness – Alberta 2010 measures current competitiveness by benchmarking our performance against similar jurisdictions. It provides a starting point from which to monitor progress.

Overall, Alberta performs well, ranking at or above average for 45 of the 60 indicators. Provincial strengths include low debt, low tax rates, high levels of labour productivity and strong investment in machinery and equipment. Areas where Alberta was scored lower than other jurisdictions include innovation, productivity growth, access to venture capital, and university degree completion.

Moving forward from this benchmarking report, the council will identify specific priority initiatives for industry and government action the four industries under review this year – Agriculture (grains and oilseeds), Manufacturing, Financial Services and Petrochemicals & Chemicals. These new actions will be detailed in a report in summer 2011.

While Alberta is a prosperous province, blessed with abundant natural resources, government and industry must continually innovate and improve productivity. This will increase competiveness and ensure Alberta remains a land of opportunity for generations to come.

This benchmarking report will help to guide decision making, as together, we strive to realize Alberta's full prosperity potential.

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Introduction and background

During the past 20 years, Alberta's economy has led Canada in average annual economic growth. Strong demand for Alberta's energy products, rising energy prices, and heavy investment in the oil sands have helped Alberta to achieve this enviable status.

*...**Alberta** cannot assume that future prosperity is assured. Government and industry must work together to enhance competitiveness...*

However, the Alberta economy is highly sensitive to global economic cycles and global energy demand. Therefore, the province cannot rest on its economic laurels and assume that future prosperity is assured. In order to achieve sustained prosperity in the long term, steps must be taken, and plans made, to build a highly competitive economy that can withstand the effects of external economic forces.

The formation of the Alberta Competitiveness Council represents an important step in this direction, signalling the Government of Alberta's resolve to strengthen its existing linkages with industry and to work in partnership to make the province one of the most competitive jurisdictions in the world. The Council is intended to foster collaboration between government, industry and Albertans, towards a shared vision to improve and sustain the province's competitiveness in the global economy.

This document, the first annual report of the Alberta Competitiveness Council, benchmarks the current state of Alberta's competitiveness on an international scale. It identifies areas of strength, highlights areas where opportunities for improvement may exist, and becomes a benchmark against which future progress can be measured.

Competitiveness and Alberta's competitiveness framework

"The fundamental source of long term prosperity is the productivity with which a nation (or province) can utilize its resources. Competitiveness is about creating the conditions under which companies and citizens can be most productive"

Michael Porter in Competitiveness Index Where America Stands, US Council on Competitiveness, 2007

*...**Competitiveness** does not represent an objective in its own right. Rather, it is a means to achieving sustained prosperity, and a higher standard of living for Alberta...*

For an individual business, competitiveness is generally defined in terms of increasing sales, lowering costs and gaining market share. For the provincial economy as a whole, however, competitiveness has a much broader interpretation – creating the right conditions so that companies and people can grow and thrive, while protecting social values and ensuring responsible stewardship of the environment. Competitiveness does not represent an objective in its own right. The ultimate objective for Alberta should be to improve the standard of living of Albertans in a sustainable way, and competitiveness represents a means to this end.

For the purposes of this report, competitiveness is defined as "the condition created when government, industry and Albertans work together to pursue sustained prosperity".

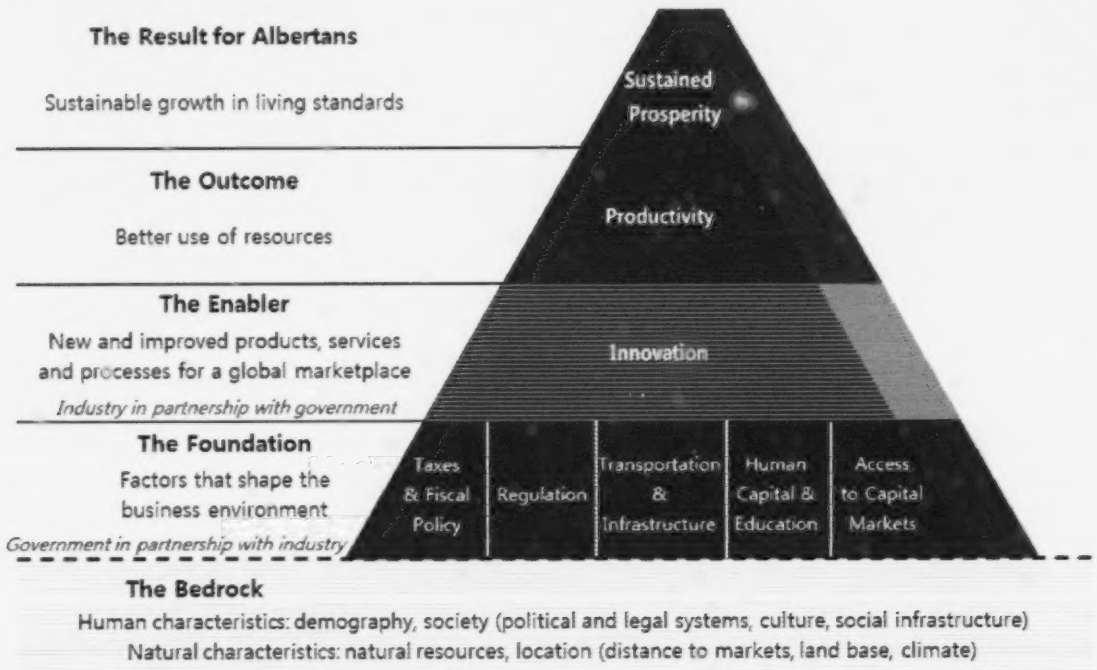
Alberta's economic prosperity can be best defined in terms of standard of living – the total level of income generated by the economy that is available for business re-investment, individual consumption and saving, and public spending on essential social services. Therefore, prosperity is best described as generating more income and a higher standard of living for Alberta – but this must be done in a way that can be maintained over generations.

*...**Higher** living standards can be achieved by working more or by working smarter. Working more has limits, but there is no limit to the ability to work smarter...*

There are two main avenues for pursuing a higher standard of living – either increasing labour effort (more people working more hours) or working smarter. While Albertans have long demonstrated their willingness and ability to work harder, this approach has obvious limits. The other option is to work smarter – to generate more income per hour, to be innovative, to increase productivity. The ability to improve productivity has no limit, provided that the economy is competitive, able to foster innovation, and able to adapt to change.

Therefore, improving productivity is the only true long term means to achieving and maintaining prosperity; and sustained prosperity, productivity, innovation, and competitiveness are all connected. A competitive economy is required to enable innovation to occur in industry, innovation drives gains in business productivity, and productivity gains are required to sustain prosperity. This relationship is illustrated in the Competitiveness Pyramid:

The Competitiveness Pyramid



In addition to the relationship between prosperity, productivity, and innovation, the Competitiveness Pyramid also identifies a range of factors that affect competitiveness and the likelihood of innovation. These factors, defined as the foundation, include taxes and fiscal policy, regulation, transportation and infrastructure, human capital and education, and access to capital markets. It is through the elements of the foundation that government can work actively to develop a more competitive business environment, to encourage industry to become more innovative and productive. Finally, the Pyramid is built on a bedrock of factors that uniquely define Alberta. These include natural characteristics that do not change (natural resources and location) and human characteristics that can only change slowly in response to social or cultural change (demography and core social structures/values).

The Competitiveness Pyramid represents the model used by the Alberta Competitiveness Council to assess the province's competitive performance.

Benchmarking Alberta's competitiveness

*...**Mobility** of both capital and labour means that Alberta's competitors are no longer restricted to neighbouring states and provinces – international comparisons are essential...*

With the bedrock under the Competitiveness Pyramid fixed, this report assesses Alberta's competitiveness by examining each aspect of the foundation, innovation, productivity, and sustained prosperity, and benchmarking Alberta against a group of national and international peers. A total 14 jurisdictions have been chosen for comparison with Alberta:

- **Canada** – British Columbia, Saskatchewan, Manitoba, Ontario, and Quebec.
- **United States** – Colorado, Idaho, Minnesota, Oregon, Texas, and Washington State.
- **International** – Finland, Norway, and the state of Queensland, Australia.

These jurisdictions were selected on the basis of their relatively strong economic performance in recent years, as well as their size, location and/or structural similarities with Alberta. This report strives to provide comparisons for Alberta and all of the 14 other jurisdictions for every benchmark measure, although comparable data are not always available for all locales, resulting in fewer jurisdictions (and/or national results) being compared for some measures.

A total of 60 individual benchmarking measures are examined in this report, with 4 to 12 measures used to assess each of the eight components of the Competitiveness Pyramid – sustained prosperity, productivity, innovation, and the five components that comprise the foundation. The measures chosen for comparison were selected based on three criteria – relevance for Alberta and its economy, the reliability of available data, and comparability to other jurisdictions.

Alberta's competitive performance

Alberta's performance in the benchmarking comparisons is generally very positive – a result that is not surprising given the strength and dynamic nature of the Alberta economy. The comparisons identify both areas of relative strength that need to be maintained and areas where Alberta performs less well – where actions by government and industry may have the potential to boost Alberta's competitiveness. In some instances strategic decisions will be required to ensure that initiatives designed to remedy an area of weaker performance do not detract from an existing competitive strength.

An overview summary of Alberta's performance for each level of the Competitiveness Pyramid is presented below:

Competitiveness benchmarking summary for Alberta

Indicator	# measures compared	
Sustained Prosperity	8	●
Productivity	12	◒
Innovation	12	◒
The Foundation:		
Taxes & Fiscal Policy	4	●●
Regulation	4	●
Transportation & Infrastructure	4	●
Human Capital & Education	11	●
Access to Capital Markets	5	◒

Legend[1]

●●	Excellent	(top quintile)
●	Good	(second quintile)
◒	Average	(middle quintile)
▙	Weak	(lower quintile)
●●	Poor	(bottom quintile)

1: The ratings of Excellent, Good, Average, Weak, and Poor take into account both Alberta's ranking among the jurisdictions compared, and Alberta's measured value relative to other jurisdictions.

One aspect to note in these summary results is the apparent "prosperity paradox" – that Alberta has achieved a "Good" rating for sustained prosperity, even though its rating is "Average" for both productivity and innovation, the elements that support prosperity in the Competitiveness Pyramid. This result can be explained by higher resource prices in recent years bolstering Alberta's prosperity, without a need for high performance in productivity and innovation. Despite this, productivity and innovation remain vitally important, as they represent the elements that can support prosperity for Alberta during downward cycles in resource prices and as conventional resource production declines.

A similar table summarizing Alberta's results for all of the individual benchmarking measures can be found at the end of this executive summary. Among the 60 measures examined, Alberta achieves a rating of Excellent (top quintile) for 23 measures, Good (second quintile) for 12 measures, Average (middle quintile) for 10 measures, Weak (lower quintile) for 10 measures, and Poor (bottom quintile) for 5 measures. While these statistical results are important as a benchmark against which future performance can be assessed, equally as important is the ability to identify areas of relative strength and areas where Alberta lags its competitors in the benchmarking results. These are identified as follows:

- **Sustained prosperity** – To achieve sustained prosperity, economic, social, and environmental considerations must be balanced. Alberta has achieved a high level of gross domestic product (GDP) per capita, strong growth in personal income, low levels of long term unemployment (resulting in critical labour shortages in some years), and strong growth in a composite Index of Economic Well-being which encompasses social and environmental considerations. However, housing affordability has become a moderate issue in the province, and growth of real GDP per capita – after eliminating gains due to increasing energy prices – is relatively weak. It is this latter factor that is of greatest concern, as income growth from high energy prices has masked low growth in real economic output.

- **Productivity** – Alberta's level of productivity – GDP per hour worked – is relatively strong, but this too has been influenced by higher energy prices in recent years as the value per unit of output has grown. After excluding the effect of higher resource prices, Alberta's real productivity growth has been comparatively weak – providing other jurisdictions an opportunity to improve their competitiveness relative to Alberta.

  *...**Alberta's** real productivity growth has been low, allowing other jurisdictions to improve their competitive position relative to Alberta...*

  Among Alberta's major sectors, agriculture and business services show good results both for their productivity levels and growth rates. While Alberta's manufacturing sector has a high level of productivity, productivity growth in that sector has been lower than in most US states in recent years. In the mining, oil and gas sector, both the level and growth of productivity are below average among the locations compared, although improvement is expected in future years as major investments in oil sands development come to fruition.

- **Innovation** – Albertans have demonstrated a strong aptitude for entrepreneurship and for employment in natural and applied sciences. Business investments in equipment, and industrial funding of university research and development (R&D) are also relatively strong in the province. Areas where Alberta's performance lags other jurisdictions include the level of overall investment in R&D by industry, the level of employment in high tech manufacturing, and knowledge intensive service industries.

- **Taxes and fiscal policy** – This represents the area of best performance for Alberta, with moderately low tax burdens for both corporations and individuals and a strong government financial position. With no specific areas of concern identified in this topic, the priority is to work on maintaining the competitive advantages that Alberta already holds.

- **Regulation** – Good regulation is about more than just the number of regulations on the books. The quality of regulations and the regulatory development process are major areas of focus for Alberta. Among the limited measures of regulation compared in this report, Alberta's results are generally positive. The processing time for development permits in Calgary and the cost of development permits and business licenses in Edmonton were the two identifiable factors that weighed down Alberta's otherwise strong ratings in this area. Business regulation is an important topic and initiatives to improve the measurement of this factor in the future are under consideration.

- **Transportation and infrastructure** – Alberta's results in this area are generally positive, rating well for the age of, and investment in, public infrastructure as well as for the penetration of broadband internet. Alberta also fared moderately well for the service provided by its airports. Similar to regulation, transportation and utility infrastructure represents an important topic, but one that can be challenging to measure. Once again, initiatives to improve the measurement of this factor in the future are under consideration.
- **Human capital and education** – Alberta has benefited from its strong education system, with high school students scoring very well on international standardized testing. Albertans are also willing to apply their skills in the workplace, as demonstrated by high employment rates, high apprenticeship completion rates, and high rates of vocational and technical (non-degree) post-secondary education. While population aging remains an issue, Alberta is better positioned than its comparator jurisdictions in terms of workforce age dynamics. The one measure for which Alberta ranks behind most other jurisdictions is its rate of university degree completion.
- **Access to capital markets** – Alberta has achieved a high level of foreign investment in its economy, bringing necessary capital to the province and demonstrating confidence in Alberta as an investment location. While not the subject of a specific measure, the presence of the TSX Venture Exchange headquarters in Calgary provides strong capabilities to raise public equity for venture-stage resource firms. Although access to capital markets for Alberta resource firms is strong, foreign investment in the province is heavily concentrated in the resource sector, and Alberta's non-resource sector lags in its ability to attract foreign investment. In addition, Alberta also fares poorly on access to venture capital in some sectors – a factor which may inhibit the growth of innovative new high tech businesses.

*...**Action** to improve weaknesses should be designed so as not to detract from existing advantages...*

This summary identifies measures where Alberta ranks behind many comparator jurisdictions. Whether or not these represent areas for improvement is a strategic decision for government and industry to consider in developing action plans based on this report. In some instances, taking action in these areas may be the preferred course of action. In other instances, working to remedy such issues may detract from an existing comparative advantage, or overall competitiveness may be better served by deploying resources to further strengthen existing advantages. These represent important considerations that the Alberta Competitiveness Council will address going forward.

A call to action

Prosperity, productivity, innovation, and competitiveness are interlinked in the modern global economy. Competitiveness paves the way for innovation, which is required to improve productivity, which is the only long term solution to achieving and maintaining sustained prosperity – irrespective of commodity price cycles.

To boost competitiveness, improve innovation, grow productivity, and sustain prosperity, action is required by both government and industry, working in partnership. This report identifies possible areas of focus for these actions, and the Alberta Competitiveness Council provides a platform for government and industry to work together to determine and execute appropriate action plans. Such action will build upon competitiveness initiatives already being pursued by Alberta firms and the Province, some of which are highlighted in this report.

This represents important work and the stakes are high – as the future prosperity of Alberta and Albertans will be determined by the actions of today.

Summary of competitiveness benchmarking indicator results for Alberta				
Indicator	**Alberta's Rank / Jurisdictions[1]**		**Indicator**	**Alberta's Rank / Jurisdictions[1]**
Sustained Prosperity – Chapter 2			**The Foundation – Chapter 5**	
GDP per capita	1 / 15	●●	***Taxes & Fiscal Policy***	
Growth in real GDP per capita	11 / 15	▪	Marginal effective tax rate on capital investment	2 / 15 ●●
Personal income per capita, after tax	6 / 15	●	Top marginal personal income tax rate	3 / 15 ●●
Growth in real personal disposable income	2 / 15	●●	Total tax burden, % of GDP	4 / 15 ●●
Housing affordability	8 / 13	◒	Government net financial assets, % of GDP	2 / 15 ●
Unemployment rate 2009	4 / 15	●	***Regulation***	
Unemployment rate 2005-2009	9 / 15	◒	Time required to start a new business	5 / 10 ◒
Index of Economic Well-being	2 / 10	●●	Cost of procedures to start a new business	7 / 10 ◒
Productivity – Chapter 3			Property transfer costs	5 / 15 ●●
GDP per hour worked	2 / 15	●	Total business costs	5 / 13 ●
Growth in real GDP per hour	12 / 15	▪	***Transportation & Infrastructure***	
GDP per hour worked, agriculture	2 / 6	●	Average age of public infrastructure	2 / 6 ●●
GDP per hour worked, mining, oil & gas	4 / 6	◒	Government investment in infrastructure	4 / 10 ●
GDP per hour worked, manufacturing	1 / 6	●●	Airport passengers per capita	7 / 15 ◒
GDP per hour worked, business services	2 / 6	●	% of households with broadband internet	2 / 15 ●●
Growth in real GDP per hour, agriculture	2 / 8	●●	***Human Capital & Education***	
Growth in real GDP per hour, mining, oil & gas	5 / 8	▪	High school math, reading, and science skills	2 / 10 ●●
Growth in real GDP per hour, manufacturing	7 / 14	▪	High school completion rate	8 / 15 ●
Growth in real GDP per hour, business services	5 / 14	●	Bachelor degree completion rate	11 / 15 ▪
Non-resource exports per capita	10 / 15	▪	Post-secondary education other than degrees	1 / 12 ●●
Non-resource exports growth	11 / 15	▪	Apprenticeship completion rate	1 / 6 ●●
Innovation – Chapter 4			Ongoing formal or informal education	3 / 10 ●
Gross expenditure on R&D, as a % of GDP	14 / 15	▪▪	Current employment rate	2 / 15 ●●
Business expenditure on R&D, as a % of GDP	13 / 15	▪▪	Change in employment rate	4 / 15 ●
Growth in total R&D expenditures	8 / 15	◒	Net migration rate	10 / 15 ◒
Number of US patents received	7 / 13	●	Share of labour force aged 55+	3 / 15 ●●
Industrial share of research funding	1 / 11	●●	Share of labour force aged less than 25	3 / 15 ●●
Investment in machinery & equipment, % of GDP	2 / 10	●●	***Access to Capital Markets***	
Investment in ICT equipment/software, per employee	2 / 7	◒	Available credit ratio	2 / 6 ◒
Employment in high-tech manufacturing	13 / 14	▪▪	Business sector foreign investment, total	1 / 6 ●●
Employment in knowledge-intensive services	13 / 14	▪▪	Business sector foreign investment, non-resource	4 / 6 ▪
Employment in natural and applied sciences	1 / 6	●●	Venture capital investment, as a % of GDP	14 / 15 ▪▪
Number of business start-ups	1 / 12	●●	Venture capital deals, per 100,000 people	9 / 13 ▪
High growth firms, as a % of all firms	1 / 9	●●		

Legend[2]		
●●	Excellent	(top quintile)
●	Good	(second quintile)
◒	Average	(middle quintile)
▪	Weak	(lower quintile)
▪▪	Poor	(bottom quintile)

1: The number of jurisdictions compared varies due to availability of data. Alberta's rank is shown relative to how many jurisdictions were compared for each measure.

2: The ratings of Excellent, Good, Average, Weak, and Poor take into account both Alberta's ranking among the jurisdictions compared, and Alberta's measured value relative to other jurisdictions.

1. Introduction

"Competitive economies are those that have in place factors driving the productivity enhancements on which their present and future prosperity is built"

World Economic Forum, The Global Competitiveness Report, 2009-2010

"Competitiveness is not about a low-cost labour force, the largest share of exports or even the fastest economic growth. It is about creating the conditions under which companies and citizens can be the most productive so that wages and return on investment can support an attractive standard of living"

Competitiveness Index Where America Stands, US Council on Competitiveness, 2007

Background

*...**Alberta** has been able to build itself a highly prosperous economy; however, this does not mean that future prosperity is assured...*

Albertans, and the Alberta economy, have long been subject to the ups and downs of the global economy; but through earlier cycles of boom and bust, the recent great boom years of the mid-2000s, and even the recent global economic recession, Alberta has been able to build a highly prosperous economy. However, this does not mean that future prosperity is assured.

Although economic forces from outside Alberta's borders are strong, a sustained prosperous future can be planned and achieved. The passage of the *Alberta Competitiveness Act* of 2010, and the formation of the Alberta Competitiveness Council, signals the Government of Alberta's resolve to strengthen linkages and work in partnership with industry to make Alberta one of the most competitive jurisdictions in the world.

The Competitiveness Council is intended to enhance collaboration between government, industry, and Albertans on issues related to competitiveness, and to provide a platform for all parties to work together towards a shared vision of sustaining and improving the province's competitiveness in the global economy.

This document, the first annual report of the Alberta Competitiveness Council, benchmarks the current state of Alberta's competitiveness on an international scale. It identifies areas of strength, highlights areas where opportunities for improvement may exist, and sets a benchmark against which future progress can be measured.

Structure, process and expected outcomes of the competitiveness initiative

Structure

Alberta's Competitiveness Initiative is led by the Alberta Competitiveness Council, formed under the *Alberta Competitiveness Act* and comprised of elected officials and senior industry representatives. This Council has been tasked to provide an analysis of Alberta's economic competitiveness in comparison to other national and international jurisdictions, and make recommendations to improve Alberta's competitive position.

This initiative is made up of several interconnecting components. The Council has formed five Task Teams, one to assess the overall economic factors of competiveness and the other four to evaluate specific economic sectors – agriculture (grains and oil seeds), financial services, manufacturing, and petrochemicals/chemicals. Each Task Team is co-chaired by a member of the Legislative Assembly and a senior representative from industry, working together to define the priorities and action plans of the Task Teams.

Process

An initial benchmarking discussion paper entitled *Alberta's Competitiveness – A Primer for Discussion* was developed in the first half of 2010 to set up the framework and define an outline for benchmarking Alberta's competitiveness. The report provided a snapshot of Alberta's overall competitiveness relative to a number of comparative jurisdictions, identifying areas of strengths and opportunities where improvements can be made.

In June 2010, a Competitiveness Forum was held in Nisku, Alberta. Attended by more than 120 senior industry and government leaders, the Forum reviewed a wide range of issues related to Alberta's competitiveness, including those identified in the *Primer for Discussion* report. Feedback from the Forum, representing views of both industry and government, has guided the ongoing directions and activities of the Competitiveness Council.

Incorporating information developed in the *Primer for Discussion* report, feedback from the Competitiveness Forum, and further input from both industry and government, this report now establishes a comprehensive set of benchmarking measures to compare Alberta to its national and international peers, and forms a baseline against which future competitiveness can be compared. This report also incorporates summaries of industry sector assessments, prepared concurrently with this report, for the four sectors selected for focus by the Council in this first year of the Competitiveness Initiative.

A final report for the first year of the Council's activities will be completed in the summer of 2011. That report will provide specific actions for government and industry to fill gaps identified in this report and to improve Alberta's overall economic competitiveness.

Expected outcomes

Alberta's Competitiveness Initiative will provide the Alberta government and industry with the necessary tools to improve the province's future competitiveness. This initiative will strengthen collaboration between industry, business, and government by encouraging stakeholders to participate in forums and consultations to discuss competitiveness. The Initiative will also inform Albertans about the province's competitive position, and the important contribution that competitiveness makes to future sustained prosperity and quality of life.

What is competitiveness?

*...**Competitiveness** is the condition created when government, industry and Albertans work together to pursue sustained prosperity...*

The definition of competitiveness varies depending upon its context. For a businessperson, the competitiveness of a firm will invariably be expressed in terms of increasing sales, lowering costs, and gaining market share.

At the level of the provincial economy as a whole, however, competitiveness has a much broader interpretation, and much greater significance for the future prosperity of all Albertans. At this level, competitiveness means the creation of the right conditions so that companies and individuals can grow and thrive economically, while reinforcing important social values and ensuring responsible stewardship of the environment.

Competitiveness does not represent an objective in its own right. The ultimate objective for Alberta should be to improve the standard of living of Albertans in a sustainable way, and competitiveness represents a means to this end.

Alberta's competitiveness framework

Alberta's economic prosperity can be best defined in terms of standard of living – the overall income generated by the economy. This income is available for business re-investment, individual consumption and saving, and public spending on essential social services. Therefore, prosperity is best described as generating more income and a higher standard of living for Albertans – but this must be done on a sustainable basis.

There are two main avenues for pursuing a higher standard of living – increasing labour effort or working smarter:

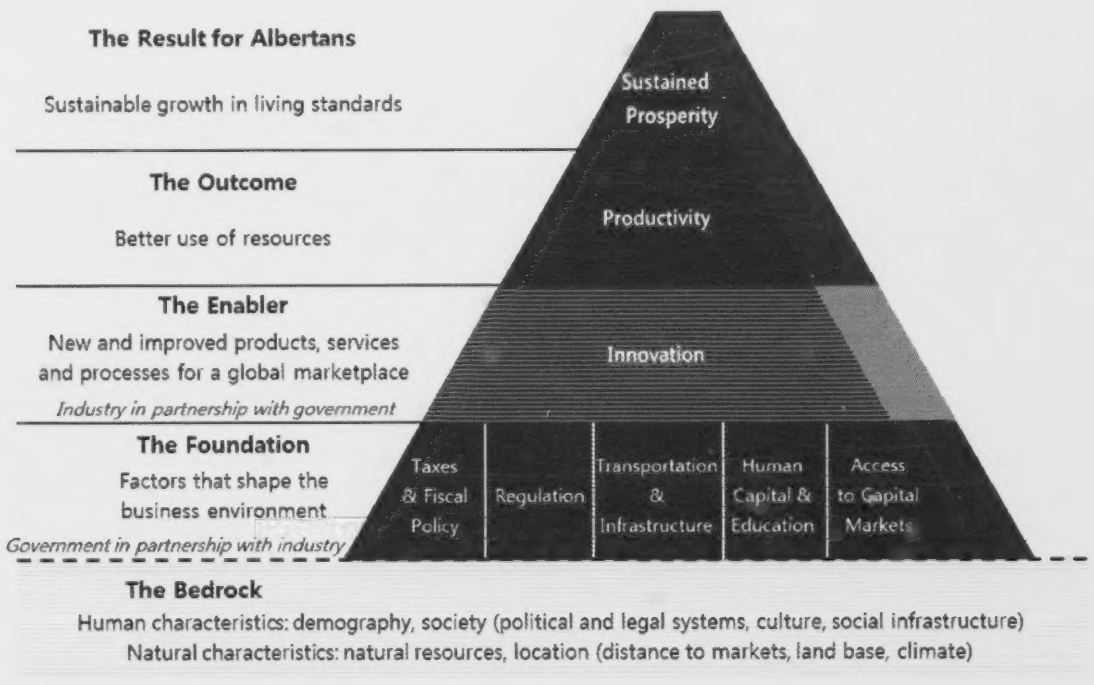
- Albertans can increase total economic income by increasing their total labour effort, either by growing the workforce or by increasing hours worked. While delaying retirement, increasing immigration, and/or working more hours per week can achieve this objective, obviously the capacity to continue working harder has its limits.
- The other option is to work smarter – to generate more output per hour worked. "Working smarter" equates to improving productivity, and the ability to improve productivity has no limit.

With an aging population and fewer future workers, Alberta's high standard of living cannot be sustained solely by relying on increased labour effort. To sustain growth in Alberta's living standards over time, productivity must grow. As leading competitiveness expert Michael Porter describes:

> *"True competitiveness....is measured by productivity. Productivity allows a nation to support high wages, a strong currency, and attractive returns to capital – and with them a high standard of living. Productivity is the goal."*

Therefore, sustained prosperity, productivity, and competitiveness are all connected: a competitive economy is required to enable productivity growth, and productivity growth is required to sustain prosperity. But competitiveness represents a complex topic, influenced by many factors. To provide a structure for assessing these issues, the Competitiveness Council has adopted the Competitiveness Pyramid to provide a framework for this analysis and its competitiveness initiatives:

The Competitiveness Pyramid



This competitiveness framework was presented in the report *Alberta's Competitiveness – A Primer for Discussion* that was reviewed and accepted by government and industry at the June 2010 Competitiveness Forum. This pyramid framework is broadly consistent with a variety of different competitiveness frameworks proposed and employed by a number of leading international economic agencies and academic institutions.

The importance of productivity to sustained prosperity has already been discussed above. Key to improving productivity is innovation by industry – finding new ways of doing things better to generate more output per hour worked. Therefore, innovation represents the third layer of the Pyramid, helping to support productivity and prosperity.

No one single factor causes innovation to occur, but rather a variety of factors can help to increase the likelihood of innovation occurring in industry. The role of government here is to establish a competitive business environment by influencing taxes and fiscal policy, regulation, transportation and infrastructure, human capital and education, and access to capital markets. These factors represent the foundation on which the Competitiveness Pyramid is based.

*...**Competitiveness Pyramid** represents the model used by the Alberta Competitiveness Council to assess the province's competitive performance...*

While government can work actively to develop a more attractive and competitive business environment as the foundation for competitiveness, once the foundation has been laid, industry has the lead role in generating jobs, innovation, productivity, and prosperity. Therefore, a strong partnership between industry and government can help to create the right mix of policies for Alberta to flourish.

Below the Competitiveness Pyramid lies the bedrock – a collection of characteristics that uniquely defines a jurisdiction. These include natural characteristics that do not change (natural resources and location) and human characteristics that are not readily changeable (demography and core social structures/values). These characteristics are generally considered to be fixed by industry and government policy makers, but do influence the approach taken in shaping Alberta's competitiveness foundation.

With the bedrock being effectively fixed over the short to medium term, this report assesses Alberta's competitiveness by considering and measuring each aspect of the foundation, innovation, productivity, and sustained prosperity, and benchmarking Alberta against a group of national and international peers.

Provincial versus sector level competitiveness

This report focuses on developing a thorough understanding of the competitive position of the Alberta economy as a whole, in order to chart a path that will lead to sustained prosperity.

The competitiveness framework applied in this study is broadly applicable to the economy as a whole, but can also be readily applied to individual sectors within the economy. In general, when comparing the competitiveness of individual sectors, additional sector-specific "micro" drivers of productivity need to be considered in addition to the "macro" level drivers examined in this report. Such additional competitiveness drivers for individual sectors may include (but not necessarily be limited to) factors related to unique demand conditions, the stage of cluster development in the industry, the degree of competition domestically and abroad, and specific factor inputs required by the industry.

This report focuses on the competitiveness of the entire economy, and cannot seek to present detailed assessments of individual industries, but does present select information on key sectors in two areas:

- The Productivity section of this report includes separate benchmarking of labour productivity in each of the natural resources, manufacturing, and business services sectors.
- Four appendices to this report include summaries of separate analyses currently being conducted for four key sectors of the Alberta economy – agriculture (grains and oil seeds), financial services, manufacturing, and petrochemicals. These four sectors represent the focus of current year competitiveness projects by the Alberta Competitiveness Council. Additional sectors will be examined in future years.

Structure of the Alberta economy

During the past 20 years, Alberta's economy has led Canada in average annual economic growth.

In 2009, Alberta's economy contracted by an estimated 4.5% due to the global economic crisis and falling commodity prices. In the same year, employment decreased by 25,200 jobs. Despite these setbacks, private sector forecasts now suggest that Alberta will again lead the country in economic growth by 2011.

The energy sector represents Alberta's driving economic force, but is supported by other key industry sectors, including:

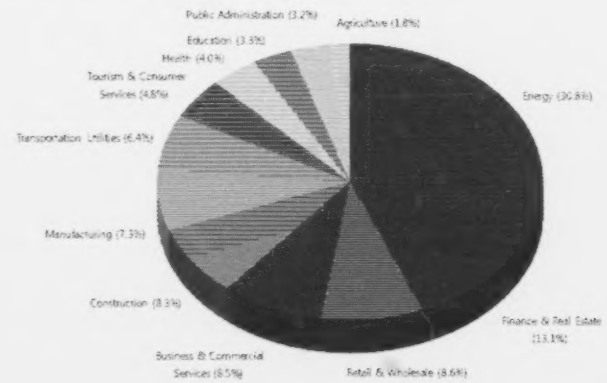
- Petrochemicals
- Finance and real estate
- Agriculture and agri-food
- Forest products
- Industrial machinery and metal fabrication
- Tourism
- Information and communications technology

While Alberta's energy sector accounts for more than 30% of its GDP, the province's GDP shares of other sectors, including construction, finance, and real estate, grew significantly between 1985 and 2008.

Alberta's economy is highly export oriented, exporting $76.8 billion worth of goods and services to 189 countries in 2009. This represents an increase of 7.3% from five years earlier.

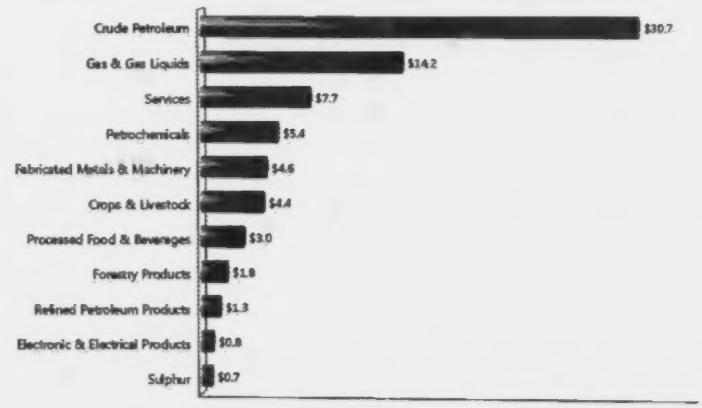
Further aspects of Alberta's economy are presented in detail as part of the benchmarking analysis set out in this report.

Distribution of Alberta's GDP (2008)



Source: *Highlights of the Alberta Economy, 2010*, Government of Alberta, page 9.

Alberta's major exports, 2009 ($ billions)



Notes: Export of services amount is an estimate. Source: *Highlights of the Alberta Economy, 2010*, Government of Alberta, page 11.

Competitiveness considerations for resource intensive economies

A highly relevant consideration for any form of economic measurement in resource intensive economies is the strong correlation between GDP, resource demand, and resource prices. As global demand for resources rises, so too do resource prices, causing GDP to climb even if output remains unchanged. Where possible, producers will respond to higher prices by increasing output, thus further raising GDP. With a higher price per barrel of oil, resource revenues grow relative to the hours worked, and this registers as gains in productivity in nominal terms (albeit not in real terms).

However, as quickly as demand can build, so too can it reverse direction. When resource prices decline and production slows, GDP can decline precipitously.

*...**It is critical** to take a long term view – to recognize that part of what is being recorded as "income" today is actually depletion of the province's natural wealth...*

This is not to suggest that the gains seen in boom years are somehow not "real". They are very real, and can be harnessed to help build competitiveness in the economy. Indeed, it is critical for resource intensive economies to take a long term view – to recognize that part of what is being recorded as "income" today is actually depletion of the province's natural wealth. Society must determine what share of this income should be directed to the development of human, physical, and technological capital – the capital that can sustain prosperity in the province once natural capital has been depleted.

One further effect of this volatility in resource-related GDP is its effect on the measurement and assessment of performance for non-resource industries. When measured as a share of GDP, non-resource industries can appear to "shrink" during resource booms, simply because they become dwarfed by resource sector growth.

To counter this issue, it has been suggested that it would be useful to benchmark Alberta against its peers after excluding the "distortion" represented by the resource sector. While the direct impact of the resource sector can readily be identified, the tentacles of the resource sector run throughout the Alberta economy, into virtually every manufacturing, service, and government sector, and represent a multitude of workers, suppliers, service providers and regulators. Therefore, to try to "separate out" the resource sector from the "rest" of the Alberta economy becomes an impossible task. If everything connected to the resource sector was removed from the analysis, the resulting picture of Alberta would be entirely unrecognizable from the reality of what exists today.

To address these issues, this report has chosen to scale some measures relative to population, instead of GDP, so that broad economic measures become less prone to volatility in resource sector revenues. In addition, a special section on productivity in key sectors does help break down the "full economy" picture and provide a view of how the non-resource sectors of the Alberta economy are performing.

Benchmarking Alberta to its peers

In an increasingly global economy, which now experiences significant mobility in both capital and labour, Alberta's competitors are no longer restricted to neighbouring provinces and US states. Instead, Alberta now finds itself competing on a global stage to attract and retain investment and talent.

Therefore, in order to more accurately benchmark Alberta's competitiveness, international comparisons are essential. This study utilizes both national and international benchmarks, which have been chosen on the basis of their relatively strong economic performance in recent years, as well as their size, locational and/or structural similarities with Alberta. In total, 14 jurisdictions in Canada, the United States, Europe, and Australia have been chosen for comparison with Alberta. These jurisdictions are detailed in the following table, which also provides a brief snapshot of each jurisdiction.

Comparator Jurisdictions

	Jurisdiction	Abbreviation	Population (2009)	Resource sector % of total GDP	Urbanizaton: % of population in metro areas > 100,000	Major Cities
Canada	Alberta	AB	3,670,742	32.2%	65.0%	Edmonton, Calgary
	British Columbia	BC	4,460,292	9.1%	68.0%	Vancouver, Victoria
	Saskatchewan	SK	1,029,124	28.9%	45.4%	Regina, Saskatoon
	Manitoba	MB	1,219,562	8.3%	62.2%	Winnipeg
	Ontario	ON	13,064,900	2.1%	81.9%	Toronto, Ottawa
	Quebec	QC	7,828,357	2.6%	64.5%	Montreal, Quebec City
United States	Colorado	CO	5,024,748	5.8%	86.3%	Denver, Col. Springs
	Idaho	ID	1,545,801	6.6%	66.2%	Boise
	Minnesota	MN	5,266,214	2.8%	76.2%	Minneapolis, Duluth
	Oregon	OR	3,825,657	2.6%	87.5%	Portland, Eugene
	Texas	TX	24,782,302	12.1%	88.1%	Dallas, Houston
	Washington	WA	6,664,195	2.3%	80.8%	Seattle, Spokane
	Norway	NOR	4,807,704	25.4%	32.4%	Oslo, Bergen
	Finland	FIN	5,331,888	3.0%	38.0%	Helsinki, Tampere
	Queensland	QLD	4,439,209	10.6%	80.9%	Brisbane, Gold Coast

This report strives to provide benchmark comparisons for Alberta to all of the other 14 jurisdictions for every measure. For some measures, comparable data are not available for all jurisdictions, and the comparison may be restricted to a subset of jurisdictions. In some other instances, comparisons may reference national values for the United States or Australia, if relevant data are not available for specific states in those countries.

In order to benchmark Alberta's competitiveness relative to this group of jurisdictions, a total of 60 individual benchmarking measures are compared in this report. Each of these measures relates to one of the eight components of the Competitiveness Pyramid – sustained prosperity, productivity, innovation, and the five components that comprise the foundation. The number of individual measures compared for each component of the Competitiveness Pyramid ranges from 4 to 12. The measures chosen for comparison were selected based on three criteria – relevance for Alberta and its economy, the reliability of available data, and the ability to compare to other jurisdictions.

Alberta's performance

An overview summary of Alberta's performance for each level of the Competitiveness Pyramid is presented in the following table. The results for Alberta are generally positive, but do also identify areas where Alberta performs less well.

Competitiveness benchmarking summary for Alberta		
Indicator	**# measures compared**	
Sustained Prosperity	8	●
Productivity	12	◉
Innovation	12	◉
The Foundation:		
Taxes & Fiscal Policy	4	●●
Regulation	4	●
Transportation & Infrastructure	4	●
Human Capital & Education	11	●
Access to Capital Markets	5	◉

Legend[1]		
●●	Excellent	(top quintile)
●	Good	(second quintile)
◉	Average	(middle quintile)
●	Weak	(lower quintile)
●●	Poor	(bottom quintile)

1: The ratings of Excellent, Good, Average, Weak, and Poor take into account both Alberta's ranking among the jurisdictions compared, and Alberta's measured value relative to other jurisdictions.

Alberta's strongest result is, not surprisingly, in the area of taxes and fiscal policy. Alberta also shows good results in terms of sustained prosperity, regulation, transportation and infrastructure, and human capital and education. The areas identified as relatively weaker for Alberta are productivity, innovation, and access to capital markets. It is important to note that the overall rating for Alberta on each of these areas is "Average". At this summary level, there are no components of the Competitiveness Pyramid for which Alberta is rated as either "Weak" or "Poor".

When examining the results for the individual measures assessed under each component of the Competitiveness Pyramid, as detailed on the following page, there are some clear areas where Alberta ranks behind many other jurisdictions. These include growth in real GDP per capita, productivity growth, non-resource exports, R&D investment, high-tech employment, and venture capital investment.

There are two important considerations that need to be evaluated in the context of these results:

- **The prosperity paradox** – Alberta has achieved a "Good" rating for sustained prosperity, even though its rating is "Average" for both productivity and innovation – the elements that support prosperity in the Competitiveness Pyramid. This result is achievable due to high resource prices in recent years bolstering Alberta's prosperity, without need for high performance in productivity and innovation. Despite this, productivity and innovation are still vitally important, as they represent the elements that can support prosperity for Alberta during downward cycles in resource prices and as resource production declines.
- **Prioritizing potential action plans**– The tables on this page and the following page identify the areas where Alberta scores below many comparator jurisdictions. Whether or not these represent areas for improvement is a strategic decision that government and industry need to consider in developing action plans based on these results. In some instances, directly addressing these factors may be the correct course of action. In other instances, working to remedy such factors may detract from an existing comparative advantage, or overall competitiveness may be better served by deploying resources to further strengthen existing advantages.

The balance of this report presents detailed information on each of the indicators, and the benchmarking comparison results for Alberta.

Summary of competitiveness benchmarking indicator results for Alberta

Indicator	Alberta's Rank / Jurisdictions[1]	Indicator	Alberta's Rank / Jurisdictions[1]
Sustained Prosperity – Chapter 2		**The Foundation – Chapter 5**	
GDP per capita	1 / 15	***Taxes & Fiscal Policy***	
Growth in real GDP per capita	11 / 15	Marginal effective tax rate on capital investment	2 / 15
Personal income per capita, after tax	6 / 15	Top marginal personal income tax rate	3 / 15
Growth in real personal disposable income	2 / 15	Total tax burden, % of GDP	4 / 15
Housing affordability	8 / 13	Government net financial assets, % of GDP	2 / 15
Unemployment rate 2009	4 / 15	***Regulation***	
Unemployment rate 2005-2009	9 / 15	Time required to start a new business	5 / 10
Index of Economic Well-being	2 / 10	Cost of procedures to start a new business	7 / 10
Productivity – Chapter 3		Property transfer costs	5 / 15
GDP per hour worked	2 / 15	Total business costs	5 / 13
Growth in real GDP per hour	12 / 15	***Transportation & Infrastructure***	
GDP per hour worked, agriculture	2 / 6	Average age of public infrastructure	2 / 6
GDP per hour worked, mining, oil & gas	4 / 6	Government investment in infrastructure	4 / 10
GDP per hour worked, manufacturing	1 / 6	Airport passengers per capita	7 / 15
GDP per hour worked, business services	2 / 6	% of households with broadband internet	2 / 15
Growth in real GDP per hour, agriculture	2 / 8	***Human Capital & Education***	
Growth in real GDP per hour, mining, oil & gas	5 / 8	High school math, reading, and science skills	2 / 10
Growth in real GDP per hour, manufacturing	7 / 14	High school completion rate	8 / 15
Growth in real GDP per hour, business services	5 / 14	Bachelor degree completion rate	11 / 15
Non-resource exports per capita	10 / 15	Post-secondary education other than degrees	1 / 12
Non-resource exports growth	11 / 15	Apprenticeship completion rate	1 / 6
Innovation – Chapter 4		Ongoing formal or informal education	3 / 10
Gross expenditure on R&D, as a % of GDP	14 / 15	Current employment rate	2 / 15
Business expenditure on R&D, as a % of GDP	13 / 15	Change in employment rate	4 / 15
Growth in total R&D expenditures	8 / 15	Net migration rate	10 / 15
Number of US patents received	7 / 13	Share of labour force aged 55+	3 / 15
Industrial share of research funding	1 / 11	Share of labour force aged less than 25	3 / 15
Investment in machinery & equipment, % of GDP	2 / 10	***Access to Capital Markets***	
Investment in ICT equipment/software, per employee	2 / 7	Available credit ratio	2 / 6
Employment in high-tech manufacturing	13 / 14	Business sector foreign investment, total	1 / 6
Employment in knowledge-intensive services	13 / 14	Business sector foreign investment, non-resource	4 / 6
Employment in natural and applied sciences	1 / 6	Venture capital investment, as a % of GDP	14 / 15
Number of business start-ups	1 / 12	Venture capital deals, per 100,000 people	9 / 13
High growth firms, as a % of all firms	1 / 9		

Legend[2]

- Excellent (top quintile)
- Good (second quintile)
- Average (middle quintile)
- Weak (lower quintile)
- Poor (bottom quintile)

1: The number of jurisdictions compared varies due to availability of data. Alberta's rank is shown relative to how many jurisdictions were compared for each measure.

2: The ratings of Excellent, Good, Average, Weak, and Poor take into account both Alberta's ranking among the jurisdictions compared, and Alberta's measured value relative to other jurisdictions.

2. Sustained prosperity

"Sustainable growth in living standards"

What it means

Sustained prosperity is defined as sustainable growth in living standards for a jurisdiction. In the broadest terms, economic prosperity reflects the total income generated each year that is available to all citizens – gross domestic product (GDP). The income represented by GDP can flow to individuals for personal consumption and saving, to companies to re-invest, or to government to fund the provision of public services.

While GDP represents an important measure of economic prosperity, to be truly competitive in a global economy it is vital to take a broader view of prosperity, as sustained prosperity is about more than just making money. To achieve sustained prosperity, a balance is required between economic, social, and environmental considerations.

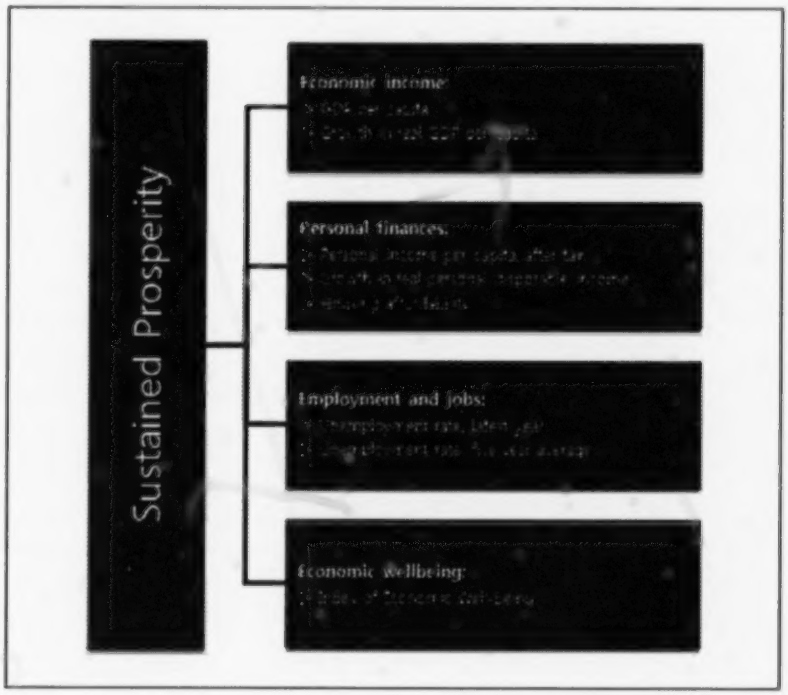
How it is measured

The internationally accepted measure of a jurisdiction's overall standard of living is GDP per capita, which reflects the total economic output generated by a jurisdiction, divided by the population. This report examines the level and rate of growth of real GDP per capita as primary measures of economic income.

A broader set of measures is needed to assess sustained prosperity, and to confirm that macroeconomic gains are benefiting Albertans at a personal level.

The state of personal finances are examined, comparing both after-tax personal income and housing affordability. This report also examines the state of the job market, to consider whether jobs are available for all Albertans seeking work.

Finally, recognizing that sustained prosperity is a complex topic, with many separate dimensions, this report also measures an Index of Economic Well-being. This composite measure of living standards assesses consumption, wealth, equality, and economic security, and incorporates both social and environmental considerations.

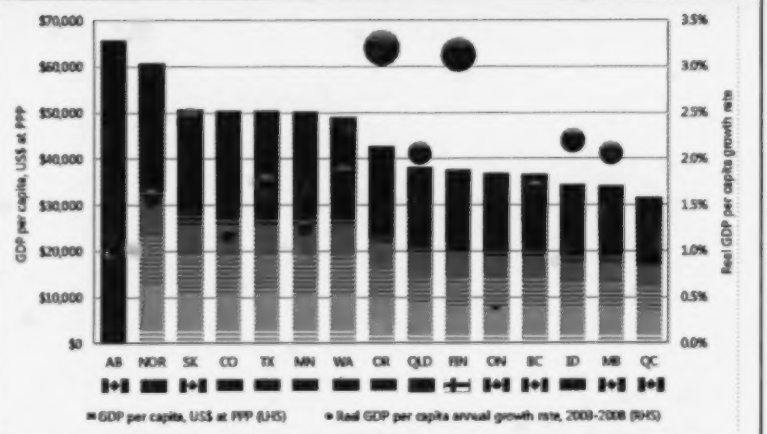


How Alberta performs

Economic income

- GDP per capita represents the internationally accepted measure of a jurisdiction's overall standard of living, and is the measure used in this report to assess macroeconomic income.
- When comparing the standard of living in international jurisdictions, it is important to recognize that a dollar of income can purchase more goods or services – or has more purchasing power – in some countries than in others. To facilitate international comparisons of GDP per capita, all GDP estimates are converted to a common currency (US dollars) using an exchange rate called the purchasing power parity (PPP) rate. These exchange rates incorporate both the current foreign exchange trading rates, plus purchasing power differences in each country, to reflect "value for money" oriented exchange rates between countries.
- Looking at the *level* of GDP per capita, in 2008 Alberta leads all jurisdictions examined. GDP per capita in Alberta in 2008 was US$65,766 – a level of income that exceeds all OECD[1] nations other than Luxembourg.
- While Norway comes close to matching Alberta's level of GDP per capita, relative to the North American jurisdictions studied, Alberta's advantage ranges from a lead of 29% over Saskatchewan, to a lead of more than 108% over Quebec.
- This high level of GDP per capita in Alberta is due to the strength of the resource sector, with high oil prices in recent years helping to boost GDP. Norway and Texas have also benefited from this effect. Growth in GDP due to resource revenues also leaves jurisdictions at risk of volatility in the future, if oil or gas reserves, demand, or prices fall significantly.

GDP per capita (2008) and real GDP per capita growth (2003-2008)

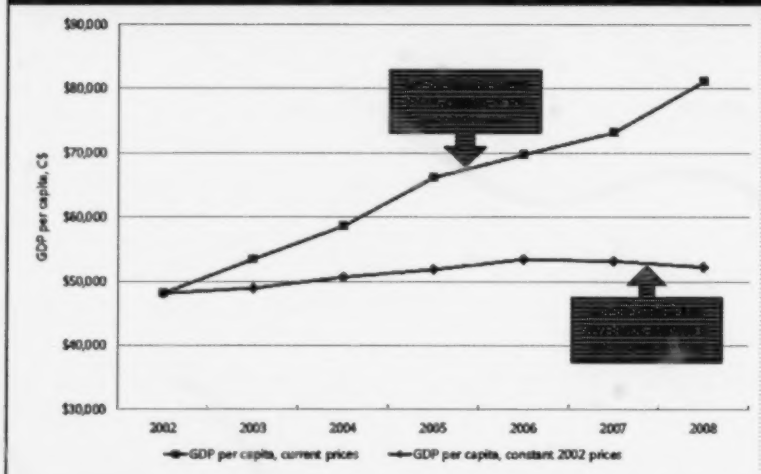


Notes: GDP per capita at current prices is in US$ at PPP. Real GDP per capita growth is based on GDP at 2002 price levels, in local currency. Sources: Statistics Canada CANSIM Tables 384-0002 (GDP) and 051-0001 (Population); US Bureau of Economic Analysis, *Regional Economic Accounts* and US Census FactFinder; Statistics Norway, subject 09-01, *Annual national accounts*, Table 2; Statistics Finland PX WebStat Database, *National Accounts*; Eurostat: Population by sex, age group and citizenship; Queensland Treasury, State Accounts, Tables 1 and 11; Australian Bureau of Statistics Publication 3101.0 Table 4; OECD PPP exchange rates.

[1] Organisation for Economic Co-operation and Development.

- Growth in GDP per capita over time is compared in *real* terms. This removes the effects of inflation from the analysis to ensure that gains in income are not simply being eaten away by inflation, leaving the population no better off than before. Real GDP per capita measures growth in the volume of activity in the economy, irrespective of how prices have changed.
- Alberta's high *level* of GDP per capita has been achieved and maintained despite modest *growth* in real GDP per capita in recent years.
- Between 2003 and 2008, Alberta's real GDP grew at an average annual rate of 3.8%; but much of this growth was attributable to a growing population, with strong net migration into Alberta. Growth in GDP per capita was far more modest, at an average rate of just 1.3% per annum, representing the 5th lowest GDP per capita growth rate among the 15 jurisdictions examined. In comparison, Saskatchewan's real GDP per capita growth rate for the period was almost double that of Alberta, at 2.4%, while both Finland and Oregon were able to grow their real GDP per capita by more than 3% per annum from 2003 to 2008.
- One reason behind Alberta's low rate of real GDP growth is the declining production of conventional oil and gas in the province, and the higher level of effort required to tap new conventional oil and gas supplies. In addition, while major new investments are being made in oil sands development, production from these developments have not yet come on stream in sufficient volume to offset shrinking conventional well production.
- Alberta's low rate of growth in real GDP per capita can be seen in the chart on this page. The red line tracks Alberta's strong growth of GDP per capita at current prices, reflecting the full benefit of increased oil and gas prices over the five years under consideration. The blue line shows Alberta's modest rate of growth in real terms – based on output – after removing the impact of rising oil and gas prices.
- Overall, Alberta's high level of GDP per capita is positive, but the low rate of growth in real GDP per capita indicates that growth has been driven primarily by increasing labour effort, rather than by improving productivity. This hard work of Albertans is also reflected in the results of the next measure, which examines personal income.

The influence of oil and gas prices on Alberta's prosperity advantage



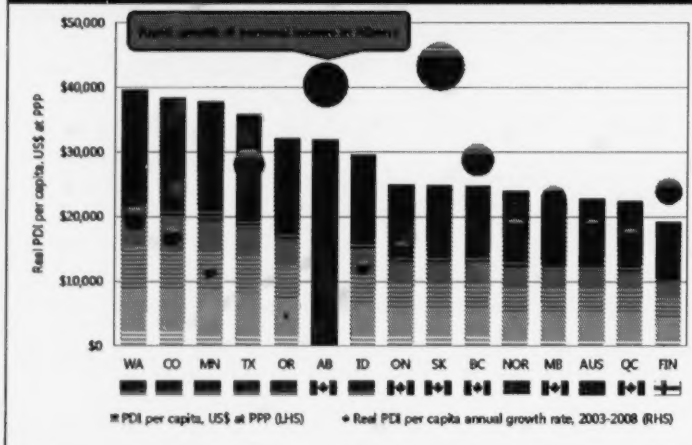
Notes: The difference between the current price and constant price GDP values represents price inflation on types of goods and services produced by the Alberta economy. This overall price inflation is very significantly influenced by rising oil and gas prices over the period from 2002 to 2008. Source:. CANSIM Table 384-0002, GDP, expenditure-based, provincial economic accounts.

Personal finances

Personal income after tax

- While Alberta has the highest level of GDP per capita among the 15 comparison jurisdictions, the same cannot be said when looking at personal income per capita after tax.
- Alberta ranks sixth on this measure, placing behind all US states except Idaho. However, Alberta is the clear leader among Canadian jurisdictions, with net personal income in Alberta (US$31,972) being 28% higher than in Ontario, Saskatchewan, and British Columbia.
- Lower tax rates partially explain the strong performance of US states in this comparison of personal income after tax. US states generally benefit from lower personal tax rates, leaving a higher proportion of take-home pay.

Personal income per capita, after tax (2008) and real growth (2003-08)



Notes: Personal income after tax represents disposable income before payment of personal social security contributions. Sources: Statistics Canada CANSIM Tables 384-0013 and 384-00123; US Bureau of Economic Analysis, *Regional Economic Accounts, State Annual Personal Income*, Table SA51-53; Statistics Norway, *Annual National Accounts*, Table 6 ; Statistics Finland PX Web Databases, *Income distribution statistics-Household's income by socio-economic group*; Australian Bureau of Statistics, 5204.0, Table 37.

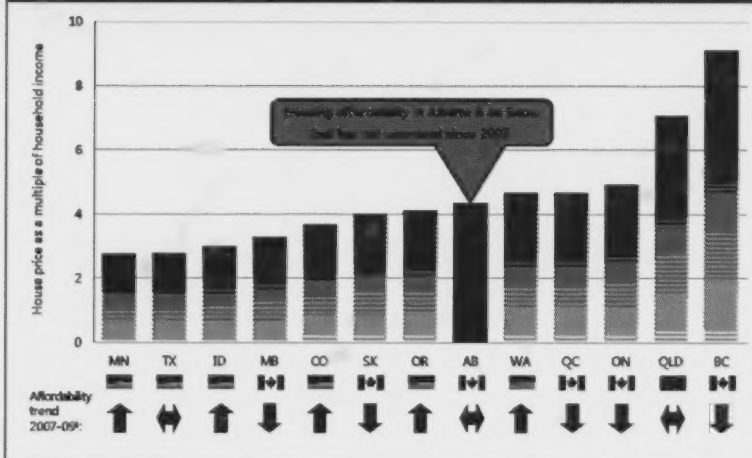
- After tax income alone does not present a truly fair comparison between Canadian and US jurisdictions. These numbers do not factor in social security payments – which can be substantially higher in the US than the equivalent CPP and EI contributions in Canada. In addition, the private medical system in the US results in substantial healthcare costs for US households, when many of the equivalent costs in Canada is covered through the tax system. According to Centre for the Study of Living Standards[1], Albertans spend less than 4% of after tax income on healthcare, while the US average exceeds 9%.
- A further consideration as to the difference between Alberta's first place rank for GDP per capita and sixth place for personal income per capita relates to the structure of the economy. Alberta's economy benefits from a very high level of foreign investment in productive capacity. One consequence of this for Alberta is that a greater share of total economic income leaves the province as returns to those foreign investors.
- On a positive note, however, between 2003 and 2008, real personal income grew rapidly for Albertans – at an average annual rate of 4%, more than three times the rate of growth of GDP per capita. Between labour shortages resulting in rising wage rates, and Albertans working long hours through the boom cycle, between 2003 and 2008 individual Albertans were able to take home a relatively larger share of the total economic pie.

[1] Index of Economic Well-being database.

Housing affordability

- For many Albertans, housing affordability is an issue just as important, or even more important, than their level of earned income. After all, earning a "high" salary is little consolation if a person still cannot afford a place to live.
- Housing affordability has been an issue of concern in Alberta – and in many Canadian cities – in recent years as house prices climbed faster than incomes. Housing affordability also integrates with both domestic and international immigration – immigrants are attracted to areas where housing is affordable, yet a high level of migration can drive up housing prices.
- Alberta ranks 8th among 13 jurisdictions for housing affordability in 2009, with median house prices being 4.4 times median annual household income (before tax). This result represents the average of Calgary and Edmonton, with houses in Calgary costing 4.6 times household income, as compared to 4.1 times income in Edmonton.
- Alberta's housing affordability declined significantly between 2005 and 2007 – with house prices rising from 3.0 times income in 2005 to 4.6 times income in 2007. Even though Albertans experienced strong income gains during this boom period, rising house prices outstripped income gains. Since 2007, however, housing affordability in Alberta has stabilized – easing marginally back to 4.4 times household income. Therefore, to the extent that house prices have risen in Alberta since 2007, average household income has risen more than enough to offset such changes.
- Relative to the other Canadian provinces, housing affordability in Alberta has actually improved since 2007 – as Alberta was the only province not to see a decline in affordability between 2007 and 2009. In the US, however, the ongoing effects of recession and the aftermath of the 2005-6 housing bubble have resulted in improving housing affordability in all US states except Texas, where affordability has barely budged since 2005.

Housing affordability (2009) and trend[1] (2007-2009)

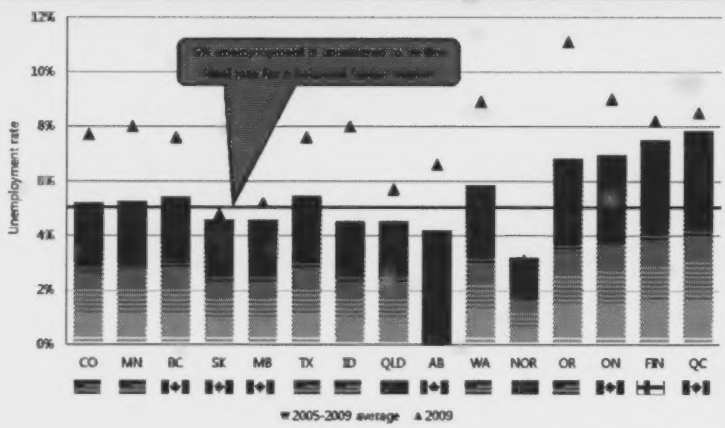


Notes: Housing affordability is measured by comparing median house prices as a multiple of median annual household income (before tax). When house price as a multiple of income rises, housing affordability declines. (1) Affordability trend represents the direction of movement for housing affordability between 2007 and 2009, which is the inverse of the movement in the charted house price / income multiple. For example, between 2007 and 2009 house prices as a multiple of income in Minnesota have decreased from 3.4 to 2.8, thus representing an increase in housing affordability in Minnesota. (2) Results generally represent the population-weighted average results for the two largest cities per jurisdiction included in the source study. Specifically, results for each jurisdiction represent the following cities: Minnesota, Minneapolis and Duluth; Texas, Dallas and Houston; Idaho, Boise; Manitoba, Winnipeg; Colorado, Denver and Colorado Springs; Saskatchewan, Regina and Saskatoon; Oregon, Portland and Salem; Quebec, Montreal and Quebec City; Washington State, Seattle and Spokane; Alberta, Calgary and Edmonton; Ontario; Toronto and Ottawa; Queensland, Brisbane and Gold Coast; British Columbia, Vancouver and Victoria. Data for Finland and Norway are not available. Source: Demographia, *6th Annual International Housing Affordability Survey*, 2010 (reporting Q3 2009 data).

Employment and jobs

- Providing jobs for Albertans is a core aspect of achieving sustained prosperity – regardless of aggregate GDP and income statistics.
- It is also important to maintain a balanced labour market – where unemployment is neither too high, nor too low. In Alberta, if the unemployment rate drops below a balanced level of 5%[1], then labour shortages can occur, negatively impacting competitiveness, and jeopardizing long term employment prospects for all workers. Therefore, for measures of unemployment, the jurisdictions have been ranked not based on the actual rate of unemployment, but rather by the variation in the unemployment rate (in absolute terms) above or below Alberta's 5% "ideal" balanced rate.

Unemployment rate (2005-2009 average, and 2009)



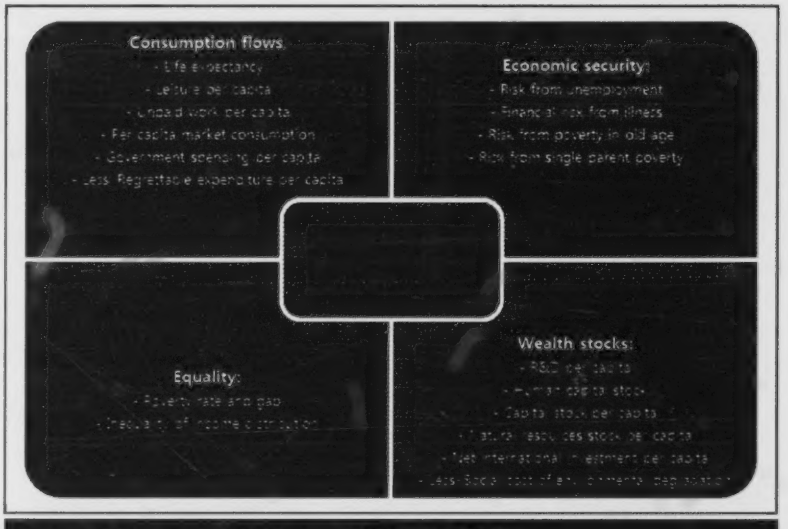
Notes: The order of jurisdictions in this chart is based on their deviation, in absolute terms, from an unemployment rate of 5%, which is treated as representing Alberta's ideal balanced labour market that works in the best interests of both employees and employers.
Sources: Statistics Canada, *Labour force survey estimates*, Table 282-0002; US Bureau of Labour Statistics, Local Area Unemployment Statistics; Eurostat, *Unemployment rates by gender*; Australian Bureau of Statistics, *6202 Labour Force, Australia*, as reported by the Queensland Office of Economic and Statistical Research. Ideal unemployment rate for Alberta of 5% is from *Building and Educating Tomorrow's Workforce, Alberta's 10 Year Strategy*, Government of Alberta, 2006.

- From 2005-2009, Alberta had the second-lowest average unemployment rate among the 15 jurisdictions, at 4.2%, behind only Norway (3.2%). However, Alberta is ranked 9th among the 15 jurisdictions for unemployment over this period, due to its unemployment being below the optimal level – resulting in labour shortages experienced from 2005 through to 2008. Of the eight jurisdictions ranked ahead of Alberta (with unemployment closer to 5%), four had unemployment rates below 5%, while four had unemployment rates above 5%.
- Alberta experienced one of the larger jumps in unemployment in 2009 as its unemployment rate shifted from below to above optimal – with a 2009 unemployment rate of 6.6%. While a high rate of unemployment is undesirable, the relatively large change in unemployment in Alberta between 2008 and 2009 demonstrates the flexibility of the labour market, as employers can adapt to changing conditions by readily staffing down, or up, as required.
- Even with this large change in 2009, due to Alberta's low unemployment rate prior to 2009, it ranks fourth among the jurisdictions for unemployment in 2009, with only three locations (Saskatchewan, Manitoba, and Queensland) ranking closer to the ideal unemployment rate of 5%. In 2009, 10 jurisdictions recorded unemployment rates higher than in Alberta, with last-ranked Oregon having an unemployment rate of 11.1%.

[1] *Building and Educating Tomorrow's Workforce, Alberta's 10 Year Strategy*, Government of Alberta, 2006.

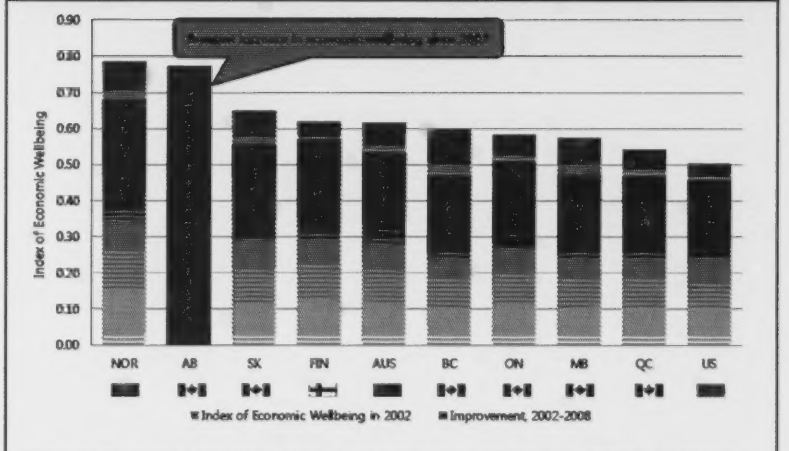
Economic well-being

- The Index of Economic Well-being was first developed in 1998 by the Centre for the Study of Living Standards, based on the work of Dalhousie University economist Dr. Lars Osberg. The index comprises four domains of economic well-being as illustrated in the diagram. Each of these domains – consumption, economic security, equality, and wealth – in turn includes a range of specific measures that are scored and aggregated to determine the Index of Economic Well-being.



- The Index of Economic Well-being is intended to provide a much broader view of well-being than can be reflected in purely economic measures related to GDP or personal income. Using the Index of Economic Well-being allows a variety of social and environmental measures – from the poverty rate to greenhouse gas emissions – to be incorporated implicitly into the results of this analysis.
- Alberta ranked 2nd among the 10 jurisdictions compared for this measure of Economic Well-being in both 2002 and 2008. Alberta also experienced the greatest degree of increase in Economic Well-being between 2002 and 2008, significantly closing the lead that Norway holds for this measure.
- Alberta's improvement in this index since 2002 is aided by the fact that it showed the largest gain in social equality between 2002 and 2008, and the second largest gain in economic security, behind only Australia.
- Overall, Alberta's positive performance on this index correlates the strong standings seen for Alberta on a wide range of specific economic and competitiveness measures assessed in this report.

Index of Economic Well-being (2002 and 2008)



Notes: Results are not available for individual US states. Sources: Centre for Study of Living Standards, *New Estimates of the Index of Economic Well-being for Selected OECD Countries, 1980-2007*, and *New Estimates of the Index of Economic Well-being for Canada and the Provinces, 1981-2008*.

The importance of environmental outcomes

Albertans define sustained prosperity to include healthy ecosystems and a healthy environment, and overall quality of life is based upon responsible development that meets the economic, environmental, and social goals of Albertans. Given this societal context, industries are increasingly reflecting the importance of responsible environmental stewardship in their business models.

While many of the indicators in this report reflect economic variables, complementary work is underway to take into account the cumulative effects of development within Alberta and the environmental performance of industry.

This is important to competitiveness from many perspectives:

- There is a shared objective of maintaining and enhancing quality of life for Albertans.
- There is a shared understanding that economic prosperity and environmental protection and quality are mutually supportive objectives. Strong environmental performance is reflective of technological innovation and effective management.
- Alberta's environmental quality is a competitive advantage in attracting human capital to this province.
- Alberta's demonstrated environmental outcomes, along with the performance and continuous improvement of industry in Alberta, contribute to meeting the sustainability expectations of export customers.

What is Alberta doing?

Land Use Framework

In 2008 Alberta established a Land Use Framework with the following objectives:

"...to manage growth, not stop it, and to sustain our growing economy, but balance this with Albertan's social and environmental goals. This is what the Land-Use Framework is about – smart growth."

This ongoing initiative is actively working to ensure that social and environmental goals are upheld, even while driving forward to improve competitiveness and achieve sustained prosperity. In conjunction with this framework, Alberta is measuring and addressing the impact of development on land, water, air, and biodiversity.

River Water Quality

Alberta has 27 Long Term River Network monitoring stations. In 2007-08, 23 stations, including all northern rivers, were rated as either "good" or "excellent". The remaining four sites, on the Battle, Red Deer, and Elbow rivers received Water Quality Index ratings of "fair".

Air Quality

The results of five annual assessments between 2001 and 2008 show that fine particulate matter and ozone levels at all monitoring stations in Alberta were lower than the Canadian standards, excluding episodes that were primarily caused by natural, background or cross-border influences.

Greenhouse Gas (GHG) Reductions

In 2007, Alberta initiated the greenhouse gas emissions program, making it the only North American jurisdiction with regulations that require mandatory GHG emission reductions from all large industrial sources.

Since 2007, GHG emissions have been reduced by 17 million tonnes – the equivalent of taking 3.4 million cars off the road - and companies have contributed $187 million to the province's clean energy fund.

Carbon Capture and Storage (CCS)

Alberta has committed $2 billion to advance the development and implementation of CCS technology. This capital is being used to support industry projects to reduce carbon dioxide emissions.

Protected Areas

Alberta has established targets to expand protected areas in each of the province's natural regions – Rocky Mountains, Foothills, Grassland, Parkland, Boreal Forest, and Canadian Shield.

3. Productivity

"Better use of resources"

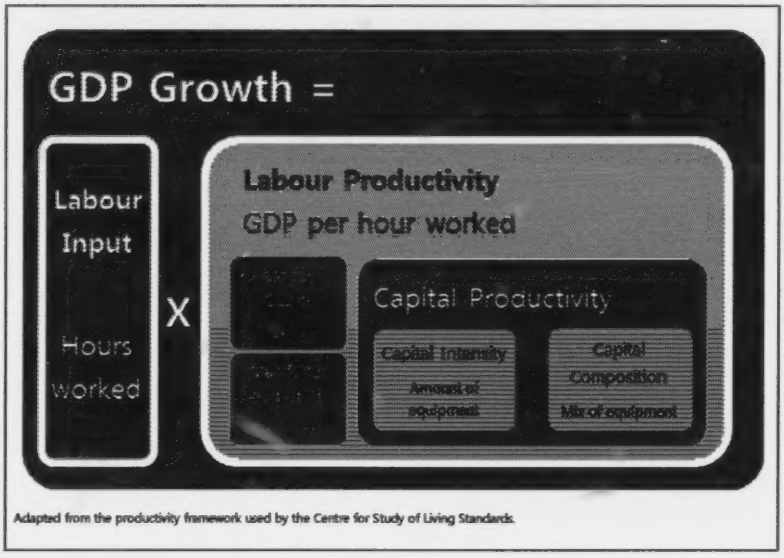
What it means

Productivity is defined as better use of resources – the ability to create more value through the use of all forms of resources – renewable and non-renewable natural resources, human resources, land, and capital – in productive activities. The more value that can be created through using a given measure of resources, the more productive the economy is.

Productivity is frequently misunderstood. In the workplace, employees worry that "improving productivity" is code for having to work longer and harder, while the company reduces the number of workers. This is not the case, as productivity improves by working smarter – finding new ways to produce more value from the same level of effort.

As illustrated in the diagram, growth in GDP can be generated by a wide range of factors. These include:

- Increasing labour input – engaging more workers and/or more hours per worker.
- Increasing labour quality – improving education and skills in the workforce.
- Increasing capital productivity, either by increasing equipment used in production, or by enhancing the mix of equipment used.
- Employing technological change, organizational change, process improvements, or other new ideas to increase efficiency – a concept known as "multifactor productivity".



Adapted from the productivity framework used by the Centre for Study of Living Standards.

While all of these factors can work to increase overall GDP growth, many of these factors can be very difficult to measure and value in isolation. Therefore, GDP growth is generally broken down between two major components – labour input and labour productivity. Labour input can be readily measured – the total hours worked – while labour productivity encompasses all the other factors that govern how much value a worker can create for every hour worked.

To generate and sustain increases in the standard of living, improving labour productivity is key – to create more value per hour worked, rather than relying on more people to work more hours. Indeed, in this framework, working more hours is the one possible cause of GDP growth that does *not* represent labour productivity growth. Sustainable growth in GDP – and sustained prosperity – must result from working smarter, and labour productivity is what makes this happen.

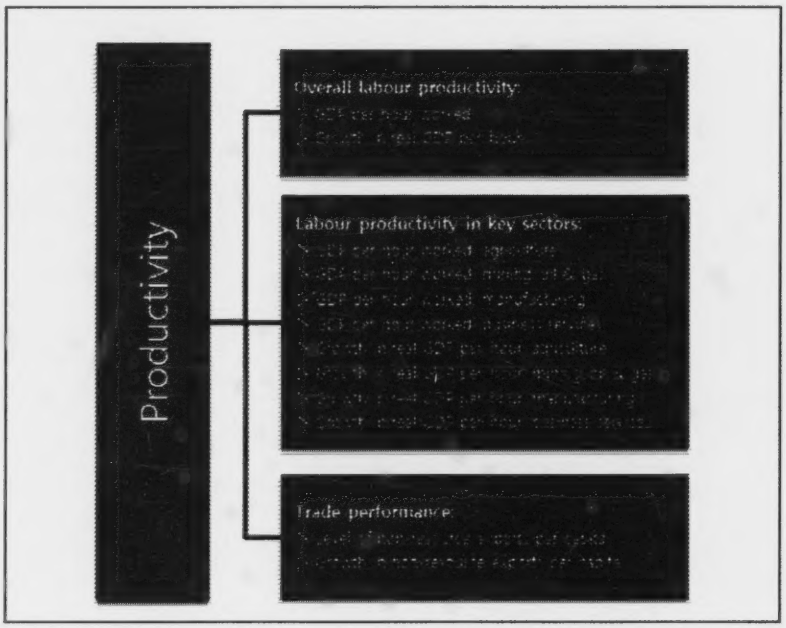
How it is measured

Labour productivity is measured as the total value of GDP, divided by the number of hours worked by all workers in the economy. This reflects the new economic value created by each hour of work performed in a given year.

To measure productivity, the overall level of labour productivity can be examined for the entire economy – and this report does so. This high-level view can mask significant differences between different sectors of the economy, and therefore it is also important to consider how productivity is tracking in major sectors of the economy.

Another way to consider productivity is to look at international trade performance. A high level of exports is evidence of a competitive and productive economy, as international buyers are choosing to source their goods and materials from Alberta, rather than other possible vendors.

Therefore, this report examines a total of 12 measures of productivity, as shown in the diagram.



Both the level of productivity (GDP per hour worked) and growth of productivity (growth in real GDP per hour) are examined for the economy as a whole, and for defined economic sectors – agriculture; mining, oil and gas; manufacturing; and business services.

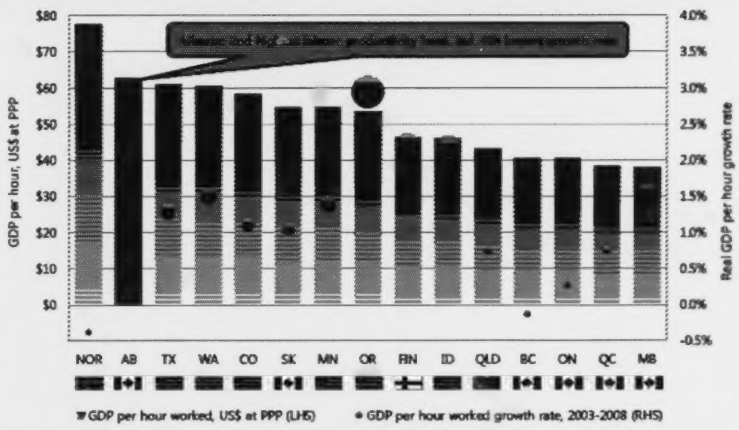
These 10 measures related to GDP are rounded out with two measures of trade performance – the level and growth rate of exports per capita. Due to the predominance of resource exports in the Alberta economy, and the limited choices the world has for where it can source oil and gas, this report focuses on *non-resource* exports per capita as a better measure of the types of goods that foreign buyers may choose to purchase from Alberta, or from many other possible suppliers.

For international comparisons, GDP per hour worked is converted into US dollars, based on the purchasing power parity (PPP) of each nation's currency.

Overall labour productivity

- Labour productivity represents the single most important factor in maintaining and enhancing long term sustained prosperity. The only other option to increase prosperity is to continually work more hours – which may generate more income, but not higher levels of well-being. Therefore, productivity is key, as the ability to improve productivity knows no limits.
- In terms of current *levels* of labour productivity, Alberta ranks 2nd among the 15 jurisdictions in 2008, with GDP per hour of US$62.80. Only Norway exceeds Alberta's productivity, earning US$77.82 per hour worked. The strong results for both of these jurisdictions, and to a lesser extent third-ranked Texas, can be attributed to high energy prices in recent years – inflating the value of output per hour.
- Alberta's advantage over other Canadian provinces is substantial. The second-ranked province in for labour productivity is Saskatchewan, which with GDP per hour of US$54.67 lags Alberta by 13%.
- While Alberta ranks well for its level of labour productivity, its *rate* of productivity growth has been slow in recent years. Between 2003 and 2008, Alberta's real GDP per hour worked expanded at an average rate of just 0.6% per annum. In comparison, Saskatchewan's real GDP per capita growth rate for the period was 1.1%, and Oregon's labour productivity grew by almost 3% per annum from 2003 to 2008.

GDP per hour worked (2008) and real GDP per hour worked growth (2003-2008)



Notes: GDP per hour worked at current prices is in US$ at PPP. Real GDP per capita growth is based on GDP at 2002 price levels, in local currency. Queensland numbers are based on assumption that average annual hours worked per employee in Queensland is equal to the national average. Sources: Statistics Canada CANSIM Tables 384-0002 (GDP) and 383-0009 (Hours); US Bureau of Economic Analysis, *Regional Economic Accounts* (GDP) and Bureau of Labor Statistics, *Current Employment Statistics* (Hours); Statistics Norway, subject 09-01, *Annual national accounts*, Tables 1 and 2 (GDP), and Table 05217 (Hours); Statistics Finland PX WebStat Database, *National Accounts* (GDP and Hours),; Australian Bureau of Statistics Publication 3101.0 Table 4 (GDP) and 6202.0 Tables 12 and 19 (Hours); OECD PPP exchange rates.

What are other jurisdictions doing?

Oregon's strong productivity growth is linked to that state's large high tech cluster. Capitalizing on a high quality of living and the presence of two large firms with strong R&D capabilities, Tektronics and Intel, the 1980s and 1990s saw Oregon attract a large pool of skilled high tech talent. More than half of the 300 high tech firms founded in Oregon between 1970 and 2001 were started by entrepreneurs with strong links to the two major companies – and some of these spin offs continue to boost the Oregon tech cluster today.

While Oregon's technology sector has seen employment decline from a peak in 2001 as it has battled both offshoring and the recent recession, in 2009 Oregon's high tech sector still employed 53,900 workers. While the sector has seen some decline, naturally, it is the highest skilled, and most productive firms, processes, and jobs that have remained in Oregon – thus driving Oregon's strong productivity gains.

- Changes in the nature and composition of Alberta's energy output are a primary cause of this low productivity growth rate.
- Production of conventional oil and gas – which has traditionally been highly productive – has been declining in recent years. In addition, as conventional oil and gas supplies are depleting, new sources are becoming ever harder, and costlier, to access than previous supplies. This notably influences Alberta's labour productivity and is expected to continue as conventional oil and gas production further declines.
- Between 2003 and 2008, substantial capital development in the oil sands also lowered Alberta's labour productivity. Large numbers of employee hours and capital dollars have been dedicated to the construction of major oil sands projects, which only now are starting to generate substantial levels of output. In the years ahead, productivity in the oil sands is expected to improve, as more projects ramp up their production. Due to the complex nature of the extraction process, the oil sands cannot be expected to experience the same level of labour productivity seen historically in conventional oil extraction.
- These circumstances of the oil and gas industry are expected to continue to affect Alberta's labour productivity, making the achievement of productivity gains in other sectors of the economy all the more important.

What is Alberta doing?

The Government of Alberta has established a mandate to:

"Develop and implement policies, initiatives and tools to help Alberta businesses to improve their productivity and global competitiveness."

In pursuit of this mandate, Productivity Alberta is ready to work with industry on improving productivity and innovation. The mission of Productivity Alberta is to create a globally competitive environment for Albertans to prosper and thrive through productivity improvement and collaborative innovation.

Productivity Alberta acts as an umbrella organization – combining and applying leading practices and expertise in manufacturing, distribution, and direct sales from a wide range of public and private sources to Alberta companies. Services and products include referrals, process improvements, leading practice research, assessment, benchmarking, creation of industry alliances, and sectorial and regional projects.

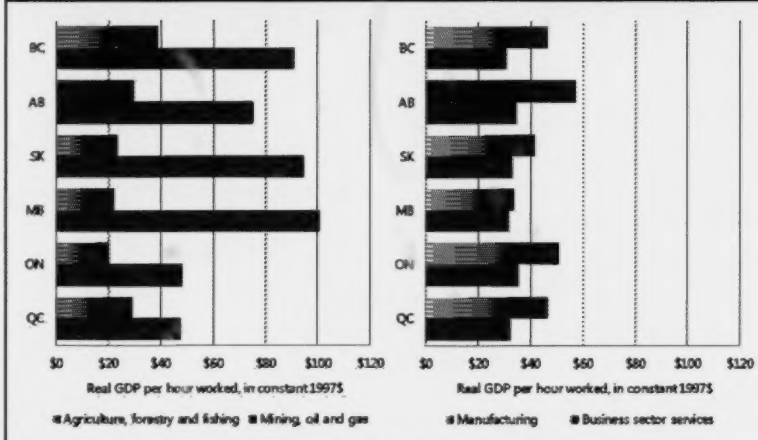
Specifically, a full-slate of productivity improvement tools, workshops, education, and assistance has been planned and developed to help businesses improve their productivity. In facilitating knowledge transfer among companies, Productivity Alberta is focusing on enhancing the 80% of innovation that is driven primarily by know-how rather than technology.

Productivity in key sectors

Productivity levels

- To get below the high-level overview of labour productivity, separate results are presented here for four segments of the Alberta economy – agriculture; mining, oil and gas; manufacturing; and business sector services.
- Due to international differences in data definitions, the level of labour productivity (dollars of value added per hour worked) within specific sectors can only be compared reliably within a single country. Therefore, the level of productivity is compared only for Alberta and the five other Canadian provinces chosen for comparison.

GDP per hour worked, by major sector (2007)



Notes: GDP per hour worked represents 2007 labour productivity, but for comparison purposes is expressed in constant 1997 Canadian dollars. Business sector services include all service industry classifications from utilities, transportation, and trade, to other services (excluding public administration, healthcare, and education). Source: *New Estimates of Labour, Capital & Multifactor Productivity Growth and Levels for Canadian Provinces*, Centre for the Study of Living Standards.

- In the agricultural sector, which also includes forestry and fishing, Alberta's productivity in 2007 ranked second among the six provinces, behind only British Columbia, whose strong result is influenced by its large forestry industry.
- For mining, oil and gas, Alberta ranked fourth among the six Canadian provinces for productivity in 2007, with the lowest level of productivity among the four Western provinces. While Saskatchewan has seen higher levels of productivity in this sector than Alberta every year since at least 1997, Alberta has been overtaken by British Columbia in 2001 and Manitoba in 2007. During this period, however, a number of major oil sands developments were under construction in Alberta, employing large numbers of workers but with little productive output. Alberta's productivity in this sector can be expected to improve once all major oil sands projects come on line.
- Alberta's manufacturing productivity is the highest among the six Canadian provinces, leading over Ontario by more than 12%.
- Business sector services cover all forms of private sector services, from utilities, trade, and transportation, to "other services". Excluded from this definition are the predominantly public sector services categories of healthcare, education, and public administration. In this sector, Alberta's level of productivity ranks second among the six provinces, marginally behind Ontario.

What is industry doing in Alberta?

Anecdotal evidence suggests that Alberta industries have been ramping up efforts to improve productivity in recent years.

More firms have been taking up the challenge of process improvement, including the use of automated materials handling, orchestrated work flows, and the adoption of LEAN and other processing approaches to reduce handling requirements.

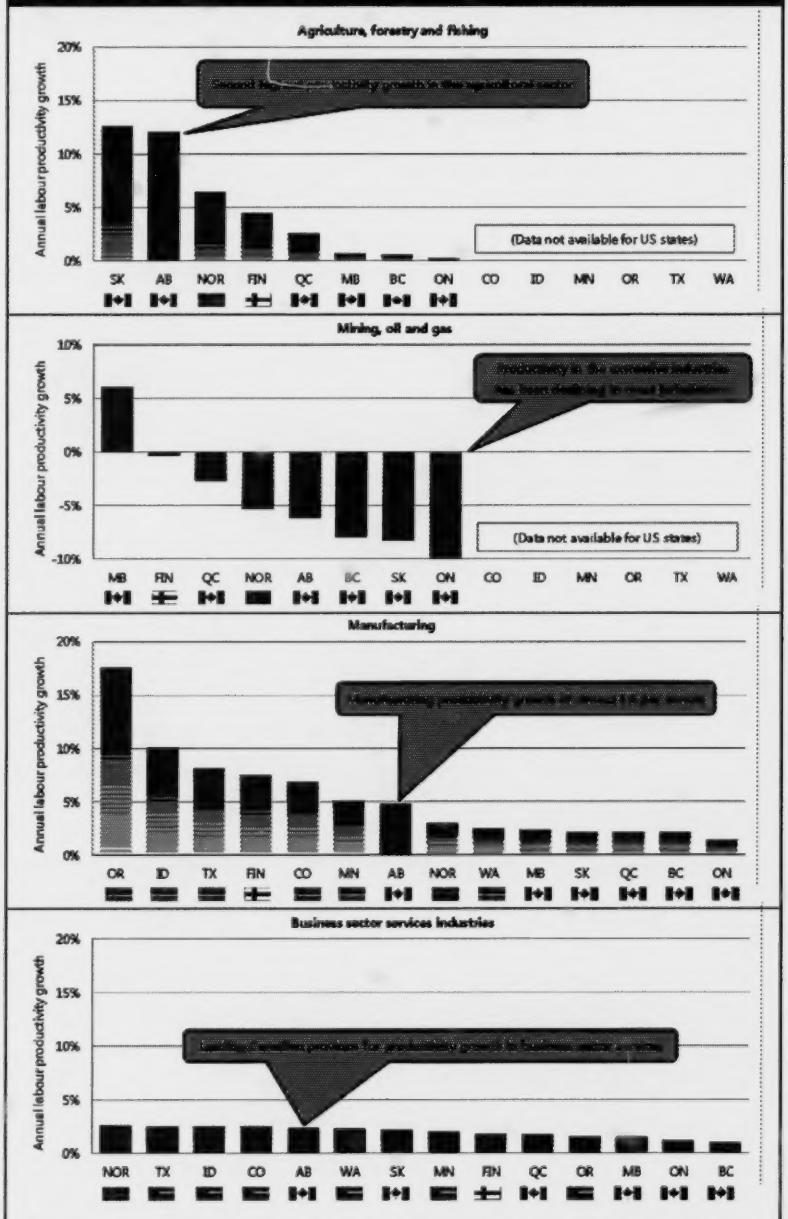
Other productivity initiatives have included consolidation of engineering requirements across competing firms to help avoid shortages of labour in key skilled trades, and the sharing of contracted foreign workers between firms to meet short term demand situations

Finally, investments in energy-efficient equipment and operations have also generated productivity improvements, and strong financial returns, for individual firms – while simultaneously helping to conserve Alberta's energy resources.

Productivity growth

- While the *level* of labour productivity per sector can only be compared reliably within a given country, it is reasonable to compare the *rate of growth* of labour productivity by sector among international locations.
- From 2002 to 2007, Alberta ranks second among eight jurisdictions[1] for productivity growth in the agricultural sector, with average annual productivity growth of 12%. Only Saskatchewan exceeded this rate of growth over the period.
- During the same five year period, productivity in Alberta's mining, oil and gas sector declined at an average rate of 6.1%. With the exception of Manitoba, all jurisdictions compared experienced declines in productivity in this sector, leaving Alberta ranked fifth among eight jurisdictions[1].
- Alberta ranked 7th among 14 jurisdictions for productivity growth in manufacturing between 2002 and 2007, with an annual average growth of 4.8%. In comparison, Oregon managed to achieve 17.6% annual labour productivity growth over the five year period.
- Alberta ranked 5th among 14 jurisdictions for business sector services labour productivity growth, with an annual average growth of 2.4% from 2002 to 2007. While Norway, Texas, Idaho, and Colorado ranked ahead of Alberta on this measure, the differences are very small, with Norway recording productivity growth of 2.6%, and the three US states 2.5%.

Labour productivity average annual growth (2002-2007)



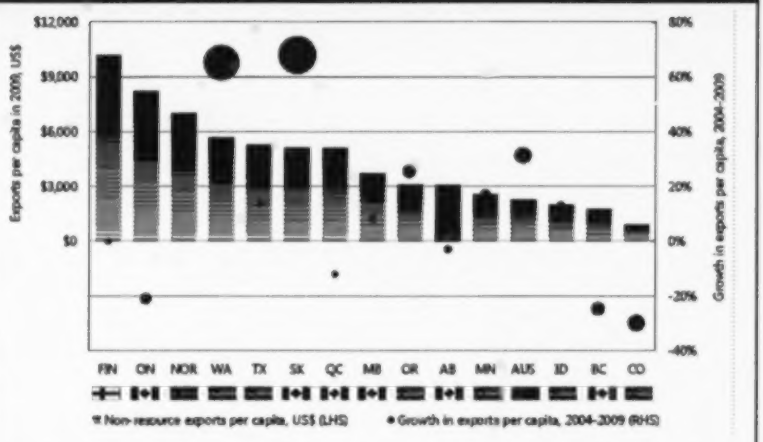
Notes: GDP growth is calculated based on real GDP per hour worked in national currency. Data are not available Queensland or for the US for the two primary resource sectors. Business sector services include all service industry classifications from utilities, transportation, and trade, to other services (excluding public administration, healthcare and education. Queensland numbers are not available. Sources: *New Estimates of Labour, Capital & Multifactor Productivity Growth and Levels for Canadian Provinces*, Centre for the Study of Living Standards; US Bureau of Economic Analysis, Regional Economic Accounts (GDP) and Bureau of Labor Statistics, Current Employment Statistics (Hours); Statistics Norway, subject 09-01, Tables 05217 and 05112; Statistics Finland PX WebStat Database, National Accounts (GDP and Hours).

[1] No compatible data is available for the United States.

Global trade performance

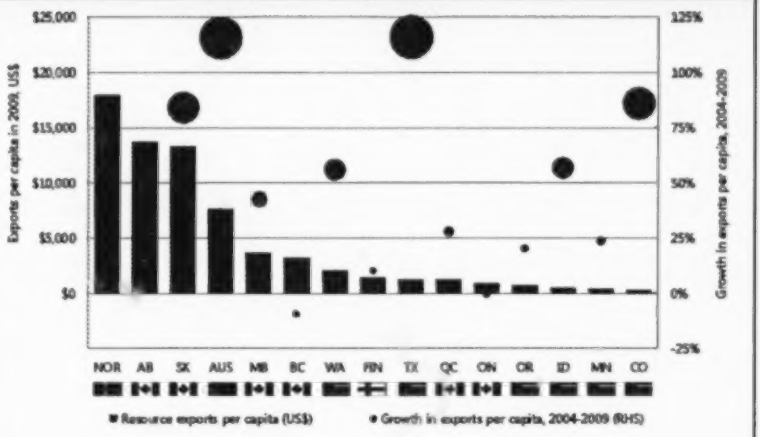
- Global trade performance reflects on productivity by demonstrating the ability of Alberta companies to compete on the world stage, and attract international buyers for their products. This is particularly true for non-resource exports, as such exports are not tied to local natural resources and foreign buyers may choose to purchase such goods either from Alberta, or from other possible international suppliers.
- Alberta ranked 10th among the 15 jurisdictions for non-resource exports per capita in 2009.
- In this measure, Alberta lags other resource-intensive economies. Norway, Alberta, and Saskatchewan are the leading jurisdictions for value of *resource* exports per capita, yet Norway and Saskatchewan both rank well ahead of Alberta in terms of *non-resource* exports per capita.
- Between 2004 and 2009, the value of Alberta's *non-resource* exports per capita declined by 2.7%. Alberta was one of six jurisdictions that saw a decline in non-resource exports per capita over that period. The demise of Nortel and its high tech manufacturing operations, along with lower US demand for building products, are among the factors contributing to Alberta's drop in non-resource exports.
- Resource exports per capita are not used as a benchmark measure in this analysis, but are presented in the lower chart for informational purposes. For resource exports, Alberta ranks 2nd among the 15 jurisdictions for the value of resource exports – behind only Norway, and just ahead of Saskatchewan – but ranks 12th among the jurisdictions for growth in resource exports between 2004 and 2009. This low growth rate for Alberta's resource exports corresponds with the decline in conventional oil output in the province, coupled with modest levels of new oil sands production as more oil sands projects reach completion and start to ramp up their levels of production.

Non-resource exports per capita (2009) and growth (2004-2009)



Notes: Non-resource exports include all significantly processed manufactured products, but excludes food products and lightly-processed wood, oil, and mineral products (SITC codes 00-34 and HS equivalents). Values are FOB, and converted to US$ at annual average exchange rates. Sources: MMK Consulting Inc. based on trade data from Industry Canada, *Trade Data Online*; US Census Bureau, *US Trade Data Online*; Statistics Norway Statbank, Table 06766; Finnish Board of Customs, *Uljas Foreign Trade Statistics*, Table SITC rev4; Australia Bureau of Statistics, Catalogue 5368.0, Table 12b.

Resource exports per capita (2009) and growth (2004-2009)



Notes: Resource exports include all food products and lightly-processed wood, oil, and mineral products (SITC codes 00-34 and HS equivalents). Values are FOB, and converted to US$ at annual average exchange rates. Sources: MMK Consulting Inc. based on trade data from Industry Canada, *Trade Data Online*; US Census Bureau, *US Trade Data Online*; Statistics Norway Statbank, Table 06766; Finnish Board of Customs, *Uljas Foreign Trade Statistics*; Table SITC rev4; Australia Bureau of Statistics, Catalogue 5368.0, Table 12b.

4. Innovation

"New and improved products, services and processes for a global marketplace"

What it means

Innovation is defined as the creation of new and improved products, services, and processes for a global marketplace, and represents a critical driver of productivity growth in the modern knowledge-driven economy.

Innovation is frequently discussed in the context of new ideas; but true innovation goes far beyond ideas. Ideas must have value – be capable of delivering new products or services that markets demand, or be capable of improving the way existing products and services are designed, manufactured, and/or delivered. This is the true spark of innovation.

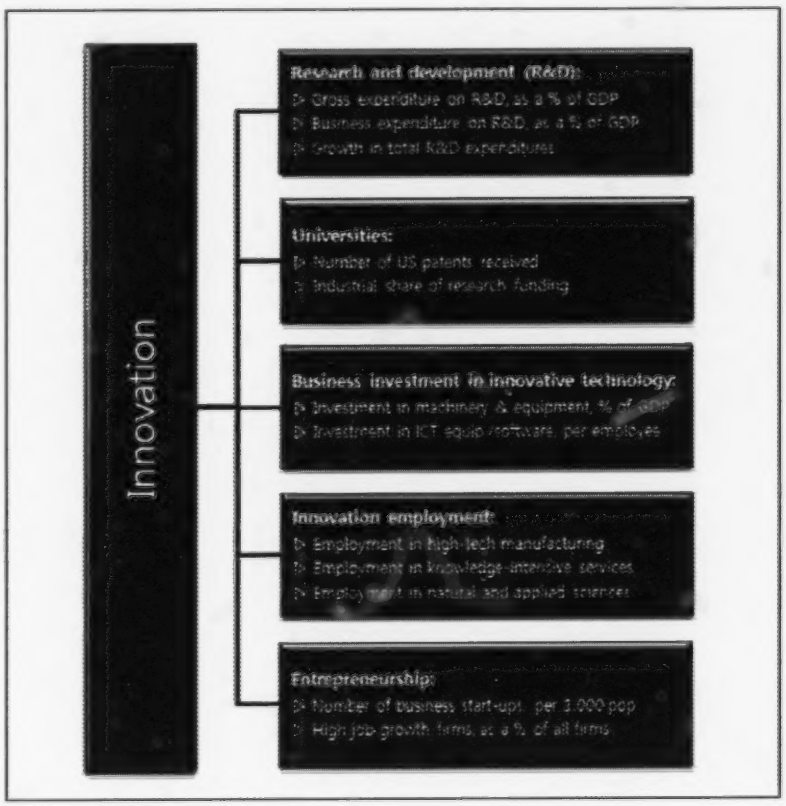
Innovation is primarily driven by industry, but with support from government. The potential sources of innovation are virtually unlimited. Whether a graduate student conducting original research, a team working on commercialization of a new technology, an engineer working in the oil sands, a manufacturer installing major new machinery, an entrepreneur introducing a new service to the market, or a production worker trying a new approach to solving an old problem – all of these represent potential sources of innovation.

How it is measured

The one common element in all forms of innovation is that smart, skilled people represent the wellspring of innovation.

Within the Competitiveness Pyramid framework used in this report, training and education of workers forms part of the Human Capital and Education component of the Foundation. So, while education is an important contributor to innovation, the measures selected for comparison in this section focus on the innovation process itself, and its outcomes.

This report examines 12 measures of innovation, as detailed in the diagram. These measures are grouped into five themes – R&D, universities, business investment in innovative technologies, innovation employment, and entrepreneurship.



Expenditures on R&D represent a key aspect of innovation. New ideas are more likely to be found if effort and funding are dedicated to R&D. This study measures the levels of both gross (total) expenditure on R&D, and those expenditures made specifically by business. As well as the relative *level* of R&D spending (expressed as a percentage of GDP), it is also important to measure the *growth* of actual R&D spending over time.

Naturally, research universities represent an important component of the innovation process. This report compares two different measures of innovative success of universities – the number of US patents earned, and the willingness of business to invest in R&D at the university.

Business investments in innovative technologies also influence innovation. Investments in machinery and equipment, and also in information and communications technology (ICT), are important elements for innovation and productivity growth. This report measures business investment in these two categories of innovative technologies.

Having skilled employees working in jobs focused on innovation is the fourth main theme for assessing innovation. Within this theme, this report measures the percentage of workers employed in high tech manufacturing industries, knowledge intensive service industries, or working in jobs that relate to science and technology. This last measure is particularly important as many jobs that relate to science and technology can occur in industries that would not generally be considered "high tech", including the oil and gas extraction industry.

The final theme for measuring innovation relates to entrepreneurship. Innovation requires a willingness to take risks and try new ideas, and thus should represent a natural fit for anyone willing to risk starting their own business. Indeed, the rationale for starting a new business often includes a desire to commercialize a new process, product, service, or idea. This report assesses the state of entrepreneurship by measuring the number of new business start-ups, and the number of firms achieving rapid job growth.

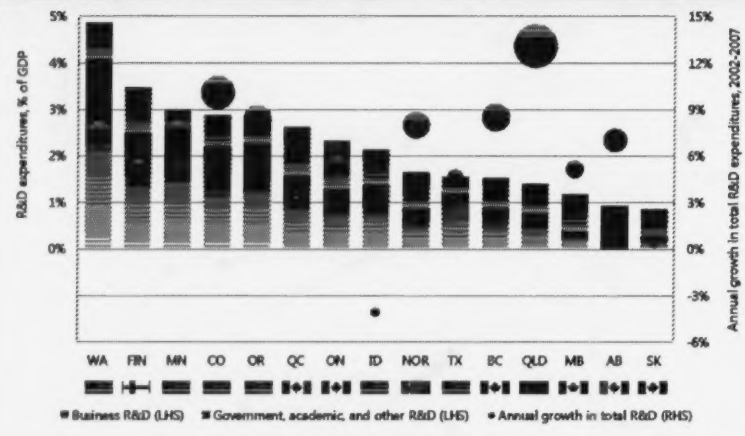
How Alberta performs

Research and development

- R&D is an important platform for innovation, and generally represents a planned, systematic search for new knowledge, whether at the conceptual (research) or applied (development) stage of the innovation process. R&D is conducted by universities, business, and non-profit research institutes, with partnerships and consortia between these groups often being used to pool R&D resources and talent.
- Three measures are used to assess R&D performance in each jurisdiction:
  - Gross (total) expenditures on R&D as a percentage of GDP, representing the total intensity of R&D in the economy, including the value of R&D performed by business, government, academia, and non-profit research institutes.
  - Business expenditures on R&D as a percentage of GDP, representing only the intensity of R&D in the business sector.
  - Average annual growth in total R&D expenditures over five years, which examines how R&D spending is changing over time.
- While these three measures of R&D activity are critically important, it is equally as important to recognize their limitations. These standard international measures reflect "formalized" R&D – specific programs of R&D undertaken in research labs, in prototype plants, and the like. What these measures cannot capture is "informal" R&D, which occurs every day on the shop floor in the manufacturing sector, in the cubicles of ICT firms, and out in the field in the resources sector.

- In terms of R&D intensity, Alberta lags behind most jurisdictions, ranking 14th for its total R&D intensity, and 13th for its business R&D intensity. Only Saskatchewan ranks behind Alberta in terms of total R&D intensity, while Manitoba also ranks behind Alberta for business R&D intensity.
- In the leading jurisdictions – Washington State, Finland, Minnesota, and Colorado – not only is the total intensity of R&D much higher than in other jurisdictions, but the level of business R&D investment is substantially higher. In these four leading jurisdictions, business R&D accounts for 80% of total R&D (on average). In contrast, for Alberta, and for the six Canadian provinces collectively, business R&D accounts for slightly less than 50% of total R&D.

R&D expenditures, percentage of GDP (2007) and growth (2002-2007)



Sources: Statistics Canada, CANSIM Table 358-0001; OECD Stats Extract, Regional Statistics, Large Regions, Innovation Indicators; Australian Bureau of Statistics Catalogue 8112.0, Research and Experimental Development, All Sector Summary, By Location.

- Government expenditures on R&D range from 0.4% to 1.0% of GDP across all jurisdictions, although Alberta sits at the low end of this range. Quebec, Ontario, Finland, Manitoba, and Norway have the highest intensities of government R&D among the 15 jurisdictions. Therefore, to the extent that Alberta and the other Canadian provinces are lagging on total R&D intensity, the primary cause is low business R&D investment, rather than a lack of government investment.

What is Alberta doing?

In 2009, Alberta introduced a provincial tax credit for Science Research and Experimental Development (SR&ED) activities conducted within the province. This measure is generally consistent with SR&ED tax credits that are offered by the federal government and a growing number of other provinces and international jurisdictions. Introducing the SR&ED credit was necessary to keep Alberta on a level playing field as a place to do R&D.

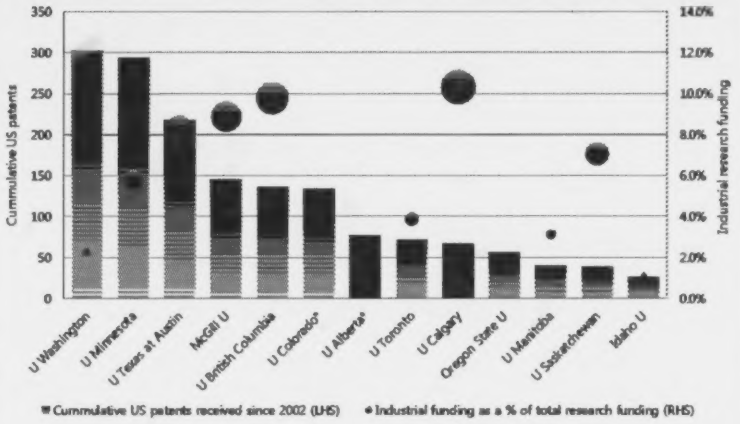
The Alberta SR&ED tax credit offers businesses a refundable tax credit of 10% on up to $4 million of eligible R&D expenses each year. Refundable tax credits represent valuable incentives to encourage R&D, by providing financing to early-stage firms that are not yet earning a profit.

- It is notable that the resource intensive economies in the comparison – Alberta, Saskatchewan, Norway, Texas, and Queensland – all trail in the ranking of R&D expenditures.
- On a more positive note, between 2002 and 2007, Alberta experienced relatively strong growth in its total R&D expenditures – growing at an average annual rate of 7.1%. This ranks Alberta in the middle of the field for growth of R&D spending, with growth rates similar to Washington and Minnesota; however, because these states have a much larger base of R&D spending, the same percentage growth in Alberta represents many fewer new R&D dollars than in these leading jurisdictions. If Alberta is to close the gap on R&D, then it needs to grow its R&D expenditures at a rate higher than the leading jurisdictions.

Universities

- Research universities represent an important source innovation, due to their high levels of formalized R&D.
- The first measure used here to assess the innovative performance of universities is the cumulative number of US patents received by each university from 2002 to 2008. This measure identifies inventions that are thought to have industrial or commercial potential.
- The universities of Alberta and Calgary rank 7th and 9th among 13 universities for US patents received. Since 2002, both universities have earned similar numbers of patents to the much larger University of Toronto, and more patents than Oregon State University.
- The leading universities for patents earned, Washington and Minnesota, have close connection with major local technology clusters – ICT in Seattle and medical technology in Minneapolis; connections which likely influence the high numbers of patents earned by these schools.
- The second measure used to compare universities is the share of total research funding that comes from industry. This measure identifies the partnership between the university and industry in their research activities, and the confidence industry has in the university's research capabilities.
- Among the 11 schools for which industrial R&D data are available, the University of Calgary is the leader. With just over 10% of R&D funding coming from industry, the University of Calgary ranks well ahead of major research universities including Washington and Toronto.

University patents received (2002-2008) and industrial share of research funding (2006-2008)



Notes: In all jurisdictions other than Alberta, the single largest publicly-funded university is shown. (*) Recent, reliable data on industrial share of research funding are not available for University of Colorado and University of Alberta. In both 2002 and 2003 (most recent reported years for University of Alberta), the industrial shares of research funding at University of Alberta and University of Calgary were virtually equivalent. Source: Association of University Technology Managers, Licensing Surveys Database.

What are other jurisdictions doing?

University-based research, and cooperation between universities, business and government, have represented important components of Finland's highly successful Innovation Strategy over the last two decades.

A government-owned research institute, VTT both conducts some R&D activity on behalf of government, universities and firms, but is also a key player in promoting cooperation in research. As one example, VTT helps to facilitate the movement of employees between commercial and academic roles, based on the needs of relevant R&D programs.

A separate government agency, TEKES, allocates R&D subsidies based on the anticipated innovation and growth benefits, with R&D funding priorities generally contingent upon partnership between the academic, public, and private sectors. Indeed, over half of funding goes to companies who are subcontracting research to academic institutions, or small and medium enterprises.

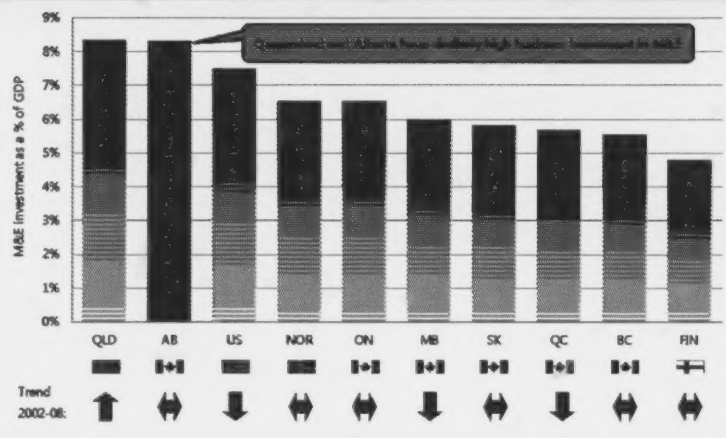
Business investment in innovative technologies

- Business investment in innovative technologies also influences innovation outcomes. Investments in machinery and equipment, and in information and communications technology (ICT), have been strongly linked to innovation.

Investment in machinery and equipment

- While Canada is frequently cited as lagging the United States for investment in machinery and equipment, this is not the case in Alberta.
- Alberta ranks 2nd among 10 jurisdictions in 2008, with business investing 8.3% of GDP in machinery and equipment. Queensland's lead over Alberta in 2008 was nominal, at less than 0.1%, although it should be noted that Queensland is the only jurisdiction where investment as a percentage of GDP is trending upwards.
- Alberta's high level of investment in machinery and equipment is understandable, given the dominance of the capital intensive oil and gas production sector in the provincial economy.
- Recognizing that some investments can be longer term in nature, if the period from 2006 to 2008 was separately compared, Alberta would lead all other jurisdictions. For that period, Alberta's investment in machinery and equipment totalled 9.0% of GDP, ahead of Queensland (8.1%) and the United States (7.8%).

Business investment in machinery and equipment (2008)



Notes: Results are not available for individual US states. Software is included in the definition of machinery and equipment in both Canada and the United States, but in other countries software is excluded from machinery and equipment. Sources: Statistics Canada, CANSIM Table 384-0002; US Bureau of Economic Analysis, *National Economic Accounts: Fixed Asset Tables*, Table 3.7E; Statistics Norway Table 05208; Statistics Finland PX Web Databases, *National Accounts, Gross Capital formation by sector*, Australian Bureau of Statistics, Catalogue 5220.0, Table 10.

What is industry doing in Alberta?

Albertan firms have been seeking innovation on many fronts in recent years, including through investment in machinery and equipment.

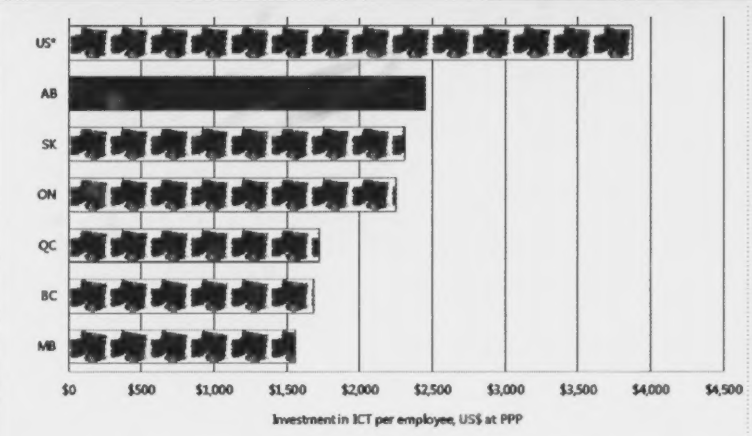
Anecdotal information from industry suggests that investment in high tech manufacturing machinery has become more frequent, with typical examples including robotic welding, heavy/high capacity machining, automated sub-arc pipe welding, and increased use of mobile cranes for materials management.

A specific example of innovation in industry is an Alberta engineering firm that has developed specialized fabrication software to assist small pipe fabrication shops in terms of their productivity and effective capacity to supply the marketplace. This has enhanced the production capacity and value added of the pipe fabrication industry in Alberta.

Investment in information and communication technologies

- Comparable data on the value of business and government ICT investments are only available among the Canadian provinces and for the US national average, so comparison for this measure is restricted to seven jurisdictions.
- Within Canada, Alberta led the six provinces compared for investments in ICT per employee in 2009. Alberta has been the leader among the provinces every year since 2007, when it overtook Ontario for per-employee investment in ICT.
- While this result for Alberta is generally favourable within the Canadian context, investment in ICT by Canadian firms lags well behind the US, as demonstrated by the strong US performance in the chart.
- Possible reasons for this lower level of ICT investment by Canadian firms include Canada's smaller share of employment in the ICT-intensive cultural and information industries, and Canada's larger share of employment in small and medium enterprises (which typically spend less on ICT than larger firms)[1].
- If ICT investments were compared as a percentage of total business investment, instead of per employee, then Alberta would rank last among the jurisdictions – due to the relatively low intensity of ICT investment within Alberta's highly capital intensive energy sector.
- Therefore, both in the national and international context, Alberta should not be complacent about its ranking for the level of ICT investment per employee.

Investment in ICT equipment and software (2009)



Notes: ICT investment includes non-residential (business and government) capital investments in computers, telecommunications equipment, and software. (*) US data represents private sector, non-residential only, divided by private sector workforce. (Government investment and public sector workers are excluded.) This distinction is not expected to result in a material difference in data comparability. The significant differential in ICT investment per worker between the US and Canada has also been confirmed in more detailed analysis developed by the Centre for Study of Living Standards (ICT Data Base, 2008 Charts and Tables, Tables S1). Sources: Statistics Canada CANSIM Tables 031-0004 (investment) and 282-0002 (employment); US Bureau of Economic Analysis, *National Accounts*, Fixed Asset Table 2.7 (investment); US Bureau of Labor Statistics, Employment *Hours & Earnings - National* (employment); OECD (PPP exchange rate).

[1] *What Explains the Canada-US ICT Investment Intensity Gap?*, Centre for the Study of Living Standards, 2005

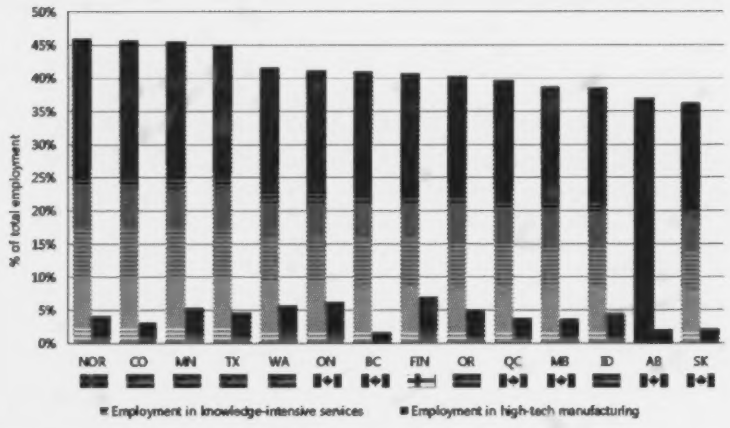
Innovation employment

- Innovation cannot occur without smart people. Within the Competitiveness Pyramid framework, education forms part of the Human Capital and Education component of the Foundation. In relation to innovation, this section examines the industries and occupations in which employees operate, and where innovation is likely to occur.

High-tech manufacturing and knowledge-intensive services

- Innovation employment based on industries is tracked by the OECD for high tech manufacturing and knowledge intensive services.
- High-tech manufacturing includes a variety of industries which are generally characterized by higher-tech products, such as computer, medical, and aerospace equipment.
- Knowledge-intensive services include a wide range of services characterized by higher levels of required knowledge, such as R&D, computer services, healthcare, education, and professional/ technical services. Many of these service industries also represent tradable services – services that can be exported to foreign purchasers.
- Due to high levels of employment in Alberta's resources sector, Alberta fares relatively poorly on these measures – even relative to Norway.
- Alberta has the second lowest level of employment in knowledge-intensive services, while Norway leads on this measure. Alberta's low level of employment in these industries may be of concern, given that a range of services supporting the resource sector are included within knowledge-intensive services.
- High-tech manufacturing is less connected to the resources sector than knowledge-intensive services. Alberta also has the second lowest level of employment in these industries, ahead only of British Columbia.

Percentage employment in high-tech manufacturing and knowledge-intensive services (2007)



Notes: Knowledge-intensive services (KIS) and high-tech manufacturing (HTM) are defined based on International Standard Industrial Codes (ISIC) as follows. HTM includes manufacture of pharmaceuticals (2423); office machinery and computers (30); radio, TV and communications equipment (32); medical, precision and optical instruments (33), and aircraft/spacecraft (353). KIS includes water/air transport (61-62); post/telecommunications (64); financial intermediation (65-67), real estate activities (70); renting of machinery and equipment (71); computer-related activities (72); research and development (73); other business activities (74); education (80); health and social work (85); and recreational, cultural, and sporting activities (92). Data are not available for Queensland or Australia. Source: OECD *Innovation Indicators Dataset*

What are other jurisdictions doing?

The Norwegian Centres of Expertise (NCE) is an ambitious government program designed to foster cluster strength and build employment in key high tech manufacturing and knowledge intensive service industries.

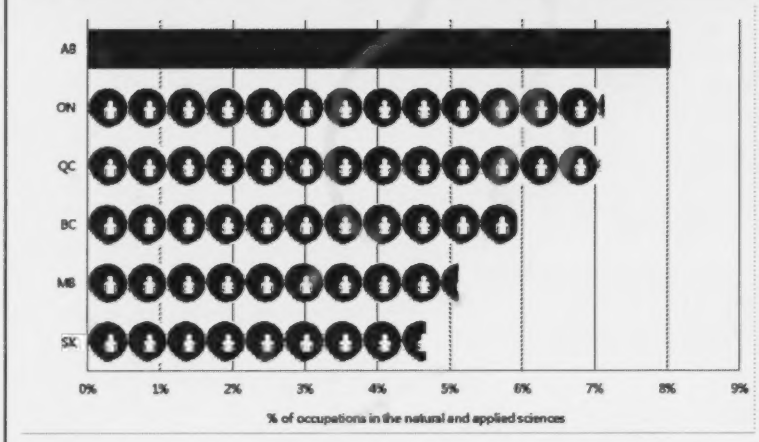
The NCE programme takes a long term perspective, with participating companies offered a range of support services for up to 10 years. Each designated cluster is based around one major company, and the NCE designation is intended to accelerate innovation through cooperation between companies, researchers, colleagues and public authorities. In addition, clusters must be internationally oriented.

Since 2007, the number of NCE clusters has increased from 9 to 12, and include clusters in energy and emissions trading, instrumentation, subsea engineering, lightweight materials manufacturing, systems engineering, nanotechnology, and cancer research.

Employment in natural and applied sciences

- The previous section focuses on employment in industries which are generally considered to be highly innovative, but without regard to the actual occupations of each employee.
- This section examines innovation employment from the counter-perspective, looking at employees working in jobs that relate to science and technology, regardless of which industries the jobs exist in. This measure recognizes that many science and technology jobs exist in industries that are not generally considered "high tech".
- Both of these measures provide valid, but different, viewpoints on the innovative potential of the workforce.
- Employment in natural and applied sciences represents a measurement concept only reported within Canada, so for this measure comparisons are limited to the six Canadian provinces.
- Alberta fares very well in this comparison, due to high levels of engineering and science (e.g., geology, chemistry) employment related to the energy resources sector. With 8% of the workforce employed in science, engineering, and other related natural and applied science roles, Alberta leads Ontario and Quebec by almost 1%, and leads British Columbia by 2% – a difference of one quarter.

Percentage of occupations in the natural and applied sciences, and related occupations (2009)



Source: Statistics Canada, *Labour force survey estimates by National Occupational Classification for Statistics*, Table 282-0009.

What is Alberta doing?

In January 2010, the government launched *Alberta Innovates*, an initiative designed to create an ecosystem of innovation for everyone from scientists involved in basic research to businesses and entrepreneurs who want to invest in ideas and transform them into products and services to be marketed globally.

Under the *Alberta Innovates* banner, the government created four new agencies whose focus is to build upon Alberta's strengths in the health, energy and environment, technology and bio sectors. The new agencies are funded by the Alberta government to be catalysts of innovation. They are empowering people to find solutions to some of society's greatest challenges such as climate change, pine beetles, bovine spongiform encephalopathy (BSE), water and soil conservation, and health research challenges from Alzheimer's disease to the West Nile Virus.

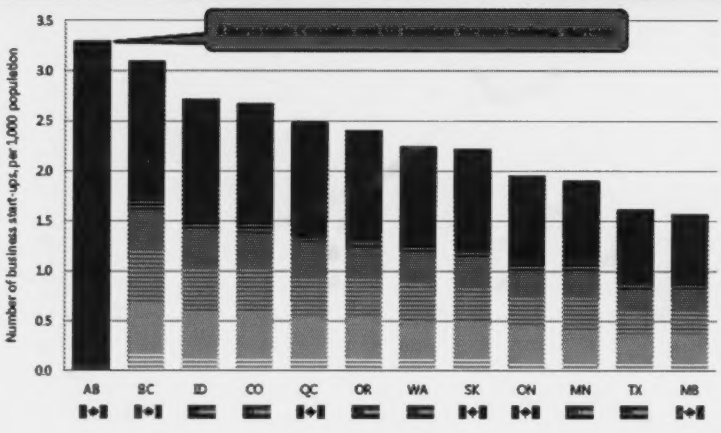
Alberta Innovates will assist Albertans working in the natural and applied sciences to move forward in innovation.

Entrepreneurship

Business start-ups

- New businesses are often founded on the basis of a great new idea, service, or product. For this reason, business start-ups are measured as one indicator of innovation.
- Alberta ranked 1st among the 12 provinces and states for new business start-ups in 2005 – the most recent year for which comparable data is available. The rate of new business start-ups in Alberta in 2005 was more than double that seen in the last-ranked jurisdictions, Texas and Manitoba.
- Alberta also led the Canadian provinces for start-ups in each year from 2002 through 2004 – reflecting the spirit of independence and entrepreneurship on which Alberta has always prided itself.

New business start-ups, per 1,000 population (2005)



Notes: Comparable data not available for overseas jurisdictions. 2005 represents most recent data released to date by both Canada and US, but more recent data will be released in the future. Sources: Statistics Canada, *Small and Medium Sized Enterprises Data Warehouse*, December 2008; US Census Bureau, *Business Dynamics Statistics, Firm Age by Firm Size by State*.

What is Alberta doing?

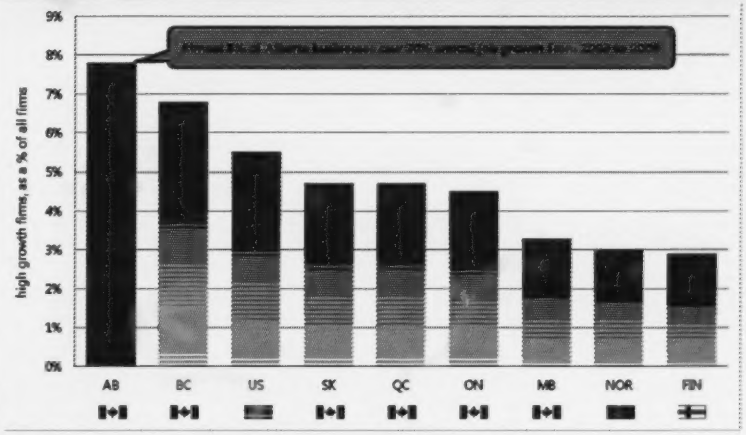
Recognizing the importance of innovative entrepreneurs, Alberta offers a number of services to help innovative small business. *Alberta's Action Plan: Bringing Technology to Market* includes the following specific support initiatives to assist emerging advanced technology firms:

- Improved access to regional business services.
- Access to technology development advisors.
- Introduction of "innovation vouchers".
- Enhanced product development centres.
- A technology demonstration fund.
- A youth techno-entrepreneurship program.

High growth firms

- While starting a new business is often an important step in the process of innovation, another critical aspect is the success of the business venture. Firms are more likely to succeed and grow if they hold some innovative advantage over their competitors, and the most innovative firms are likely to experience rapid growth.
- High growth firms have been identified as firms experiencing job growth of more than 20% per annum for three straight years. Many such businesses would represent small and medium businesses, for the simple reason that large percentage increases in employment become harder to sustain as companies become larger.
- Based on this measure, Alberta leads among the nine jurisdictions compared, with almost 8% of firms surpassing 20% job growth each year from 2004 to 2006. Alberta's lead over second-ranked British Columbia is notable, and Alberta's rate of success in developing high growth firms is 40% above the US average.

Firms experiencing job growth >20% for three straight years (2006)



Notes: Results represent the percentage of all firms that experienced employment growth in excess of 20% in each of 2004, 2005, and 2006. Data not available for Australia or for individual US states. Data for Finland represents 2005 as 2006 is not available. Sources: Statistics Canada, Small and Medium Sized Enterprises Data Warehouse, December 2008; OECD, *SDBS Business Demography Indicators*.

5. Foundation

"Factors that shape the business environment"

What it means

The foundation of the competitiveness pyramid is defined by the factors that shape the business environment. These are the building blocks of the economy that drive future innovation and productivity. The elements of the foundation create the conditions that enable industry to be innovative and more productive. These include taxes and fiscal policy, regulation, transportation and infrastructure, human capital and education, and access to capital markets.

Government has a lead role in shaping and improving the foundation, but industry also has a role in helping to develop key aspects of the foundation, including technology infrastructure and business financing mechanisms.

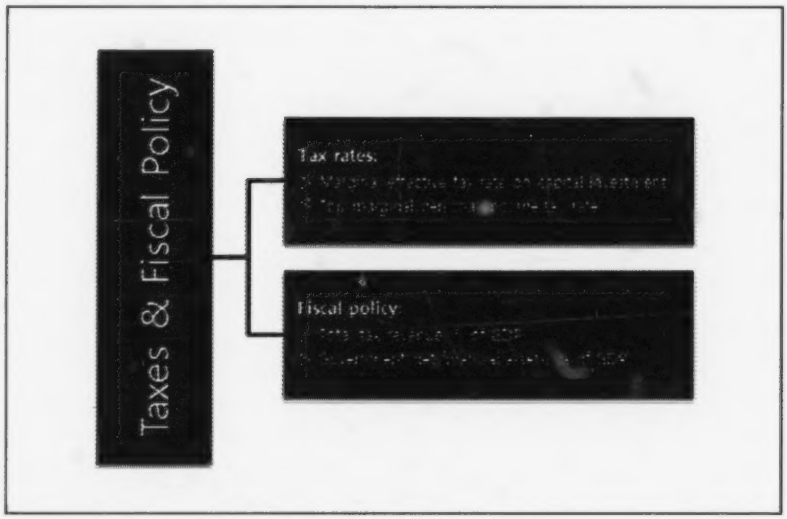
Developing a robust foundation does not ensure sustained prosperity; however, if the foundation is weak, achieving sustained prosperity becomes a far more challenging task.

Taxes and fiscal policy

How it is measured

High taxes can limit investment and wealth creation, and choices made through fiscal policies can result in situations where high taxes become unavoidable. Therefore, this report measures these two important topics together.

Taxes play a significant role in shaping day-to-day economic decisions of both business and individuals. From companies choosing to relocate to another jurisdiction due to an adverse tax structure, to an individual opening a new Tax Free Savings Account, taxes affect decision making in a profound way.



As shown in the diagram above, this study uses two measures to compare taxes, looking at the marginal effective tax rate for businesses, the top marginal income tax rate for individuals.

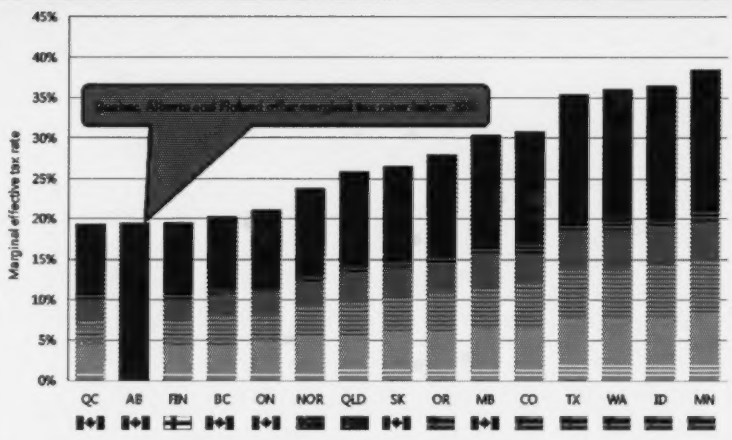
Fiscal policy can signal future economic stability, and future tax levels. To compare the fiscal policy of jurisdictions, this study looks at current government tax revenues (total tax revenue as a share of GDP), and the government's net savings or indebtedness (net financial assets).

How Alberta performs – taxes

Business taxes

- Competition for new business investments is fierce, and having a competitive tax environment can make a difference in a jurisdiction's ability to attract such investments.
- Business taxes are compared using the Marginal Effective Tax Rate (METR) on capital, a calculation that is inclusive of corporate income tax, gross receipts tax, capital tax, and sales tax. METR is calculated as the annualized value of the taxes paid by large and medium sized corporations on their profits and capital inputs, expressed as the share of these taxes in the pre-tax rate of return to capital.
- Alberta scores strongly on this measure, with the second lowest METR among all jurisdictions, behind only Quebec. Quebec's lead is the result of a 5% investment tax credit offered for manufacturing and processing assets in that province.
- Alberta's low METR reflects its low corporate income tax rate, and the fact that it does not levy other taxes that impact business, such as capital, payroll, and sales taxes.
- This will be an important measure to monitor, as expected tax changes in British Columbia and Ontario may bring their METR's down in line with Alberta over the next two years.
- The distinction between Alberta and all US states is significant. Oregon, the highest-ranked US state, ranks 9th among 15 jurisdictions, with a METR of 28%, and Manitoba is the only non-US jurisdiction to rank behind Oregon.

Marginal effective tax rate on capital investment (2010)



Notes: Finland, Norway, and Queensland rates reflect 2009, but are believed to be unchanged for 2010. Sources: *Canada's Tax Competitiveness After a Decade of Reforms: Still an Unfinished Plan*, Duanjie Chen and Jack Mintz, University of Calgary School of Public Policy, 2009; and *Marginal Effective Tax Rate on Capital Investment: Alberta and 15 Provinces/States*, Duanjie Chen and Jack Mintz, University of Calgary School of Public Policy, 2010.

What is Alberta doing?

Recognizing that tax rates are not the only cost associated with paying taxes, Alberta has been working to reduce the administrative cost of taxes, for corporations.

Alberta has developed a number of e-commerce initiatives to improve efficiencies and reduce costs and administrative burden associated with making and processing tax payments. Specific examples of e-commerce services that are currently available include:

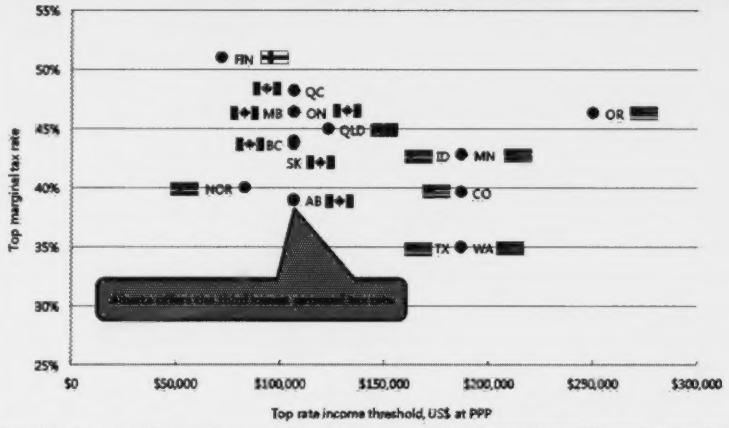
- Prescribed rebate off-road percentages.
- Tax exempt fuel sales.
- Tourism levies.
- International fuel tax agreement submissions.

Electronic filing of corporate income tax returns, already in place in some other provinces, is scheduled for 2011.

Personal taxes

- Personal tax rates, and especially the top marginal rate paid by high income earners, are important because of the influence they have on the ability to attract top-notch management, engineering, and R&D personnel to live and work in a jurisdiction.
- The top marginal tax rate of 39% in Alberta ranks behind only those US states that do not impose personal income tax – Texas and Washington State – where the US federal rate of 35% represents the top marginal rate. However, those US states do have heavier tax burdens in other areas, including sales taxes, that compensate for the lack of personal income taxes.
- The top tax rate in Alberta is at least 4.7 percentage points lower than in the other Canadian provinces compared, and 9.22 percentage points lower than in Quebec. This advantage is largely due to Alberta's adherence to a low single-rate personal income tax system (10%), as compared to the multi-rate systems used in other provinces that result in higher top marginal tax rates.
- Finland has the highest top marginal tax rate, at 51%, having gradually dropped from 55% since 2003. As well as the highest tax rate, Finland also has the lowest income threshold at which the top marginal rate is incurred.
- Oregon's tax rate and threshold are both increased in 2010 due to a temporary high-income surtax being assessed in 2009 and 2010. Both Oregon's top tax rate and income threshold will decrease in 2011.

Top marginal personal income tax rate, and corresponding income threshold (2010)



Notes: Income thresholds are converted to US$ at PPP exchange rates. US income thresholds represent thresholds for married persons filing separate returns. Thresholds are higher for single tax filers. In all countries, medical levies, social security, and similar additional specific-purpose levies are not included. Sources: KPMG Canada, *Tax Facts*; US Tax Foundation, Federal and *State Tax Rates Tables*; PriceWaterhouseCoopers, *Worldwide Tax Summaries*; Australian Taxation Office, *Tax Rate Tables*; OECD PPP exchange rates.

What is Alberta doing?

While Alberta-based individuals and businesses enjoy the lowest overall tax burden of any jurisdiction in Canada, many other provincial jurisdictions have been reducing some taxes in recent years.

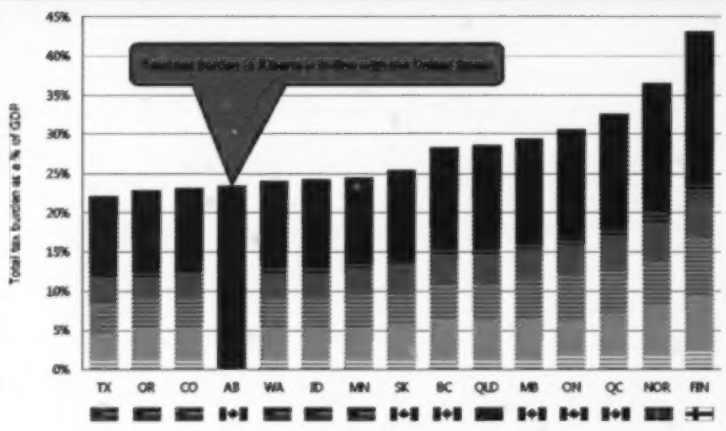
Alberta Finance and Enterprise regularly monitors tax changes in other jurisdictions and prompts government decision makers to take action as required to ensure that Alberta remains Canada's most tax-competitive jurisdiction.

How Alberta performs – fiscal policy

Current taxation revenue

- Taking a broader view of taxes within the context of overall fiscal policy, total tax burden looks at the sum cost of all taxes, imposed by all levels of government, relative to GDP. This measure helps to compare jurisdictions, regardless of how they structure or label their various taxes.
- For this measure of total burden, including federal, provincial/state, and local taxes, Alberta ranks 4th among the 15 jurisdictions.
- US states hold six of the top seven rankings on this measure. Alberta's ability to offer a competitive tax environment compared to the US is notable, given that – unlike US states – Alberta's tax revenues fund a universal public healthcare system that does not impose substantial additional private health related costs on the business sector.
- Some tax burden studies only consider the senior levels of government, but the inclusion of local government is essential to a fair comparison. In Alberta, the municipal tax burden accounts for 1.57% of GDP (of a total of 23.45%), but in four of the six US states compared (CO, OR, TX, and WA), as well as in Ontario and Quebec, the municipal tax burden is more than double that seen in Alberta.
- Relative to the Canadian provinces, Alberta's tax burden ranges from 2.0 percentage points lower than Saskatchewan, to 9.2 percentage points lower than Quebec. Alberta's low personal and corporate income tax rates, and no sales tax are the reasons for the lower tax burden.

Total tax burden as a percentage of GDP (2008)

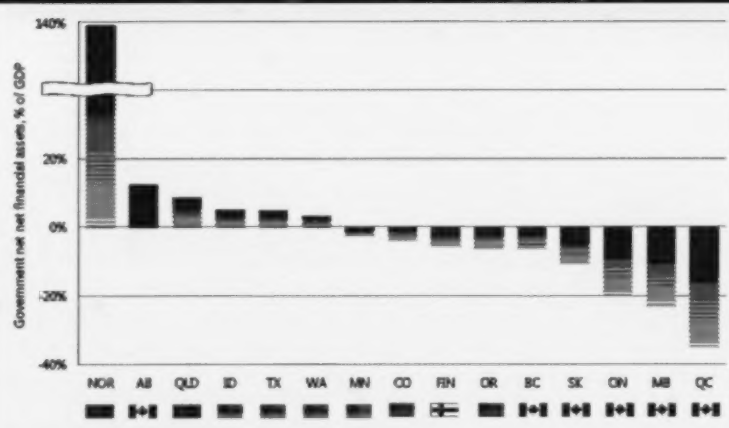


Notes: Calculation includes taxation at all levels of government: federal, provincial/state, and local for calendar year 2008. Where fiscal years don't align with the calendar year, tax revenues were apportioned equally by month. Federal tax collections are apportioned by province/state based on relative shares of total GDP. Tax burden includes all forms of taxes and social security contributions, but excludes resource royalties (or other special taxes on resource profits) and gambling revenues. Sources: Alberta Finance & Enterprise and MMK Consulting Inc. calculations based on data from the Public Accounts of Canada, 2008 and 2009; Provincial Public Accounts, 2008 and 2009; CANSIM Table 384-0002; Régie des rentes du Québec, Annual Reports 2008-9 and 2009-10; Annual Report of the Canada Pension Plan, 2008-9 and 2009-10; US Census Bureau, State Government Tax Collections and State and Local Government Finances; Bureau of Economic Analysis, Regional Economic Accounts; Internal Revenue Service Data Book 2008 and 2009; Statistics Finland, Tax and tax-like payments; Statistics Norway Statbank, Subject: 12 Public finances, Table: 07486; and Australian Bureau of Statistics 5506.0 Tables 1 and 4, 5220.0 Table 1, and 5512.0 Table 333.

Government net savings or indebtedness

- "Net debt", or net financial assets (financial assets – liabilities) represents the current balance of savings – positive or negative – for each jurisdiction.
- The value of a positive net financial position to government should not be underestimated. With net financial assets in the bank, governments have greater ability to weather short term fiscal storms, and to make strategic investments to enhance competitiveness.
- Alberta ranks second on this measure, with positive net financial assets, including the Alberta Heritage Savings Trust Fund that are the result of both the province's significant natural resource endowment and its strict fiscal policy line of avoiding debt financing.
- All jurisdictions place far behind Norway, which has built up public savings that exceed GDP. However, in the tax measures above, Norway consistently placed behind Alberta, indicating a higher tax burden on current citizens – allowing the government to save a larger share of resource revenues for the future.
- Jurisdictions below the line have a "net debt" position – and Alberta is the only Canadian jurisdiction not in this position. In addition, three of the six US states compared were in a net debt position as at 2008.

Government net financial assets as a percentage of GDP (2008)



Notes: Represents financial assets – liabilities. Pension plan assets are excluded, either based on accounting classification (Canada, Australia), or by exclusion of data (United States, Finland). All jurisdictions represent the consolidated position for the central government only (provincial, state, or national, as relevant), excluding local government. Data reporting for Norway between central government and social security funds shows the social security funds accounts at zero. It is unclear whether Norway's social security funds are co-merged with central government funds, whether the social security program is outside the government reporting entity, or whether central government accounts included unfunded social security liabilities, if any. This issue could work to diminish the load shown for Norway in this chart, but regardless of this issue, Norway's financial asset position would be expected to far exceed all other jurisdictions. Sources: Statistics Canada Table 385-0014; U.S. Census Bureau *State Government Finances*; The Pew Center on the States, *The Trillion Dollar Gap: Underfunded State Retirement Systems and the Road to Reform*, February 2010; Australian Bureau of Statistics Publication 5512.0 Table 233; Statistics Norway, statistics subject 12-01: Government assets and liabilities, Table 2; Statistics Finland, General government financial accounts, Appendix table 1.

How it is measured

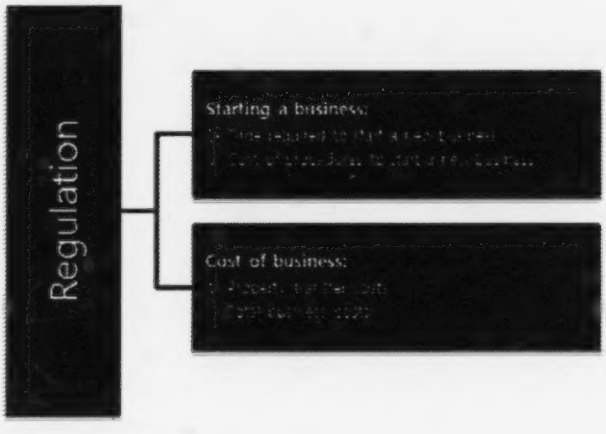
The regulatory environment cannot be measured as readily as other elements of competitiveness.

Good regulation is about more than just the number of regulations in a given jurisdiction. In fact, quality of regulations and the regulatory development process has become the main focus of both the Government of Alberta and international regulatory reform experts (as noted in the box: "What is Alberta Doing?").

Based on specific initiatives under development by the Alberta Regulatory Review Secretariat, future editions of this benchmark report may be able to incorporate more comprehensive measures of the regulatory environment. In the interim, this report includes four measures that demonstrate specific elements of the impact and cost of regulation on business.

Measuring the time required and the cost of required procedures to start a new business enterprise represent two very direct measures of how business regulation impacts upon business start-up, whether major corporations needing to incorporate a new subsidiary or joint venture, or small entrepreneurs starting their own business.

A less direct impact of business regulation is on the cost of doing business. This report assesses two business cost measures. The first is the cost of transferring a property, where regulations re transfer fees and taxes can have a significant impact on such a transaction. The second measure is more general, looking at the total cost of doing business in each jurisdiction.



What is Alberta doing?

In recent years the Government of Alberta has been pursuing a Regulatory Excellence initiative. Led by the Regulatory Review Secretariat within Alberta Finance and Enterprise, this initiative focuses on the relevancy, transparency, and efficiency of government regulation.

This initiative has been re-shaping the way regulations are created, reviewed, and revised in Alberta, to achieve compliance with 14 positive indicators of regulatory management systems identified by the OECD:

- Explicit policies exist to guide regulatory reform.
- An oversight body exists to advocate for regulatory quality.
- Linkages exist to ensure coherence between regulation and policy.
- Parliament has an active role in fostering better regulation.
- Regulators are trained to adopt and use tools for better regulation.
- Regulatory policies are coordinated across levels of government.
- Regulatory impact analysis is required for new regulations.
- Alternatives to regulation are considered in the regulatory process.
- Compliance and enforcement are considered in regulatory design.
- Administrative simplification for business and citizens is considered.
- Mechanisms exist to mandate periodic regulatory reviews.
- Regulations are transparent and accessible to the public.
- Consultation is included in the regulatory development process.
- Business and citizens are informed of regulatory developments

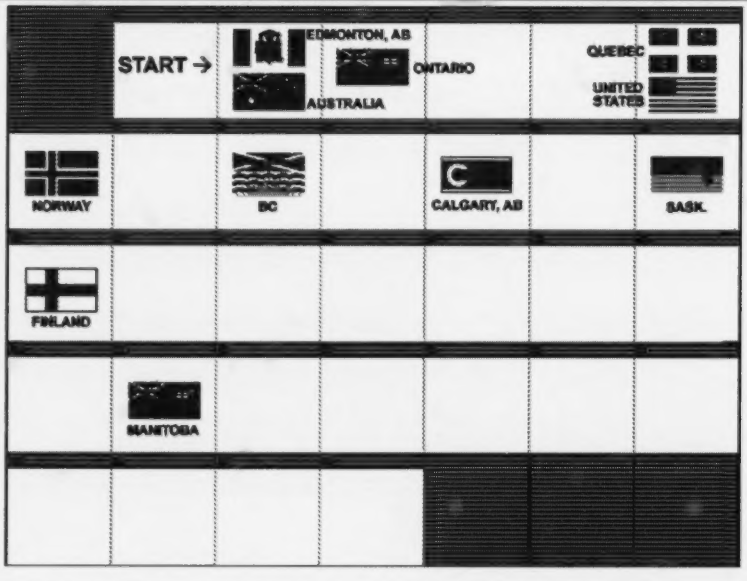
1. *Indicators of Regulatory Management*, OECD, 2009.

How Alberta performs – starting a business

Time required to start a business

- Regulation, permitting, and licensing can all represent hindrances to the start-up of a new business entity – whether a small entrepreneur trying to get their own business up and running, or a large corporation that needs to move quickly to establish a new corporate entity.
- The World Bank *Doing Business* project compares the ease of starting a business in countries around the world, considering the time, cost, and number of procedures required to get a new company up and running. In that international comparison, Canada ranks 2nd among 183 countries for the ease of starting a business.
- This report compares international results from the *Doing Business* report, to comparable results developed for each of the Canadian provinces, reflecting provincial incorporation requirements.
- The results of this analysis vary by city, due to local licensing and permitting requirements. While results for other jurisdictions reflect the single major business centre in each jurisdiction, within Alberta results are presented separately for Edmonton and Calgary.

Time required to start a new business (2010)



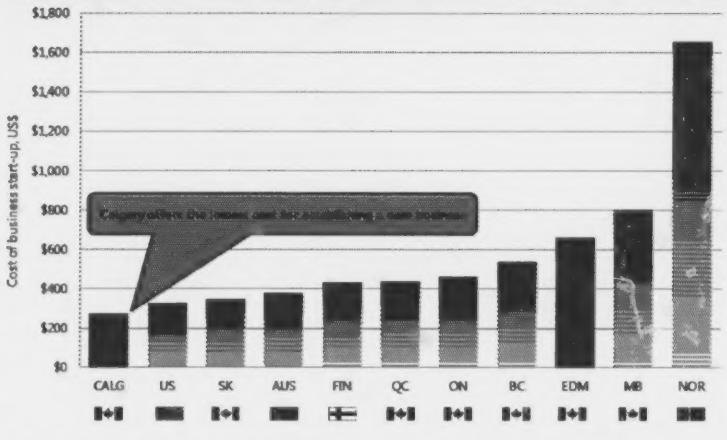
Notes: Results represent the elapsed time required to complete all incorporation, business licensing, building occupancy, tax registration, and/or workers' compensation registration requirements prior to commencing operations for a new general business office in an existing office building in the largest city in each jurisdiction. Results allow for ability for procedures to be completed concurrently. Results are not available for individual US states. Sources: Australia, Finland, Norway, and United States: World Bank, *Doing Business Report 2010*. Comparable results for Canadian locations were developed using the World Bank methodology and data from BizPal, provincial corporate registries, approved private registration service providers (where applicable), city development and licensing departments, Canada Revenue Agency, provincial tax agencies, and provincial workers' compensation agencies.

- Edmonton, along with Australia, offers the fastest start-up time for a new general office business, with all required incorporation, permitting, and registration procedures able to be completed in just two days.
- In comparison, procedures in most jurisdictions take between 6 and 14 days to complete. Calgary falls within this range, at 11 days. The difference in timing between Calgary and Edmonton relates to the city development permit required prior to occupying a business premises. For an office-based business locating into an existing office space, the development permit can be obtained same-day in Edmonton, as compared to a processing time of up to 10 days in Calgary.

Cost of starting a business

- When looking at the cost of starting a new business, the results for Calgary and Edmonton are reversed from those presented above for the time required to start a business.
- Among the 11 jurisdictions compared, Calgary offers the lowest cost for starting a new business, at just C$284. In comparison, Edmonton ranks 9th among the 11 jurisdictions, with higher costs than in most other jurisdictions.
- Once again, the difference in results between Edmonton and Calgary is due to city permits and licenses. There is no cost for the required permits from the City of Calgary for this sample start-up business, while the development permit and local business license required in Edmonton add C$399 to the business start-up cost.
- This analysis only reflects the fees associated with required start-up procedures. The analysis does not include the value of time spent by company employees on the various procedures.

Cost of required procedures to start a new business (US$, 2010)



Notes: Results represent the cost of all required fees (including rush fees, where relevant) to complete incorporation, business licensing, building occupancy, tax registration, and/or workers' compensation registration requirements prior to commencing operations for a new general business office in an existing office building in the largest city in each jurisdiction. Results only include out-of-pocket costs, and do not include the cost of company employee time spent on each procedure. Results are not available for individual US states. Sources: Australia, Finland, Norway, and United States: World Bank, *Doing Business Report 2010*. Comparable results for Canadian locations were developed using the World Bank methodology and data from BizPal, provincial corporate registries, approved private registration service providers (where applicable), city development and licensing departments, Canada Revenue Agency, provincial tax agencies, and provincial workers' compensation agencies.

What is Alberta doing?

BizPal is an online information tool developed by Industry Canada to help entrepreneurs find information about the various federal, provincial and municipal permits and licences that are required when starting a new business. BizPal represents a unique partnership among federal, provincial, territorial, regional and local governments to create a central information repository, and is designed to cut through the paperwork burden and red tape that small business owners encounter.

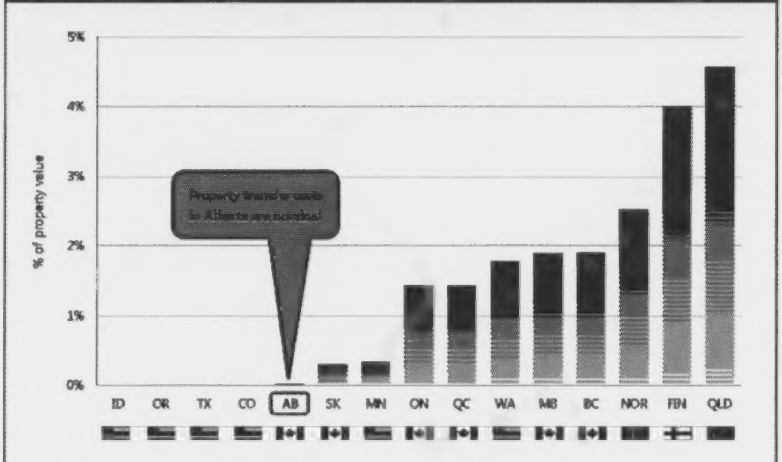
The Government of Alberta pays the annual licensing fees for Alberta municipalities to be members of BizPal. Within Alberta, 97 communities covering 82% of the Alberta population have chosen to take advantage of this initiative and integrate their regulatory data with BizPal.

How Alberta performs – cost of business

Property transfer costs

- When purchasing real estate, either for personal use or for a business operation, property transfer fees and taxes can have a significant impact on the final cost of the transaction. These fees or taxes often end up being hidden – capitalized in the cost of the property rather than explicitly viewed as an additional expense.
- Based upon the cost of transferring a property valued at US$2 million, Alberta ranks 5th among 15 jurisdictions for regulatory costs associated with the transfer.
- Property transfer costs in Alberta represent just 0.02% of the property value. The only jurisdictions that rank ahead of Alberta on this measure are three US states where no material property transfer costs apply – Idaho, Oregon, and Texas; and Colorado, where the transfer cost is just 0.01%.
- These five jurisdictions stand in contrast to all others compared. In Saskatchewan and Minnesota transfer rates are approximately 0.3% – 15 times higher than in Alberta. Transfer costs in all other jurisdictions exceed 1.4% of the property value, while transfer costs in Finland and Queensland exceed 4.0% of the property value – 200 times higher than in Alberta.

Property transfer cost, as a percentage of value on a US$2 million property (2009)

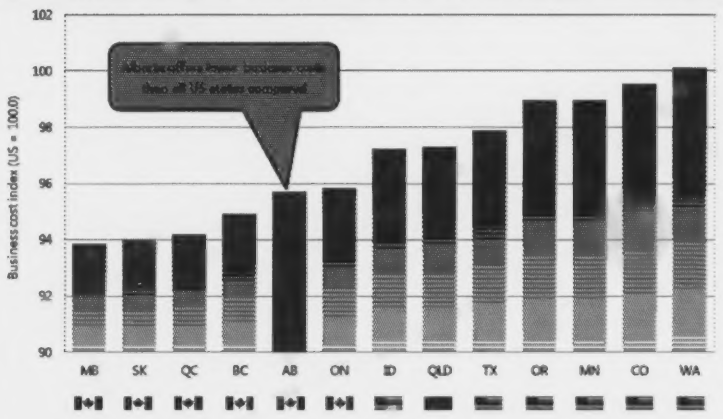


Notes: Includes all material transfer fees, taxes, and stamp duties. Sources: KPMG *Competitive Alternatives 2010*, World Bank *Doing Business 2010*.

Total business cost

- As noted by the US Council on Competitiveness, *"Competitiveness is not about a low-cost labour force..."*. However, offering a business climate in which businesses can operate profitably, with a reasonable level of business costs, does represent one important aspect of a competitive location.
- Business costs also implicitly reflect the results of many types of regulatory activity. From provincial regulation of labour standards, transportation, and utilities; to municipal land use policies; to tax rates and regulations at all levels of government; many forms of regulation ultimately end up impacting the overall cost of business in a jurisdiction.
- According to KPMG's international business location study, *Competitive Alternatives 2010,* business costs in Alberta are competitive with the United States. Alberta reports a business cost index of 95.7 – representing business costs 4.3% below the United States baseline.
- For the US states compared, Idaho's business cost index is 97.2 (2.8% below the US baseline), while in Texas costs total 97.9. Costs in the other four US states compared are within approximately 1% of the US baseline.

Business cost index, United States = 100.0 (2010)



Notes: Business cost index expresses total business costs, including taxes, in percentage terms relative to a the United States baseline of 100.0. The US baseline represents the average of business costs in the four largest US business centers: Chicago, Dallas, Los Angeles, and New York City. Results for each jurisdiction represent a single major metropolitan area, as follows: Manitoba, Winnipeg; Saskatchewan, Saskatoon; Quebec, Montreal; British Columbia, Vancouver; Alberta, Edmonton; Ontario; Toronto; Idaho, Boise; Queensland, Brisbane; Texas, Houston; Oregon, Portland; Minnesota, Minneapolis; Colorado, Denver; Washington State, Seattle. Data for Finland and Norway are not available. Source: KPMG, *Competitive Alternatives 2010.*

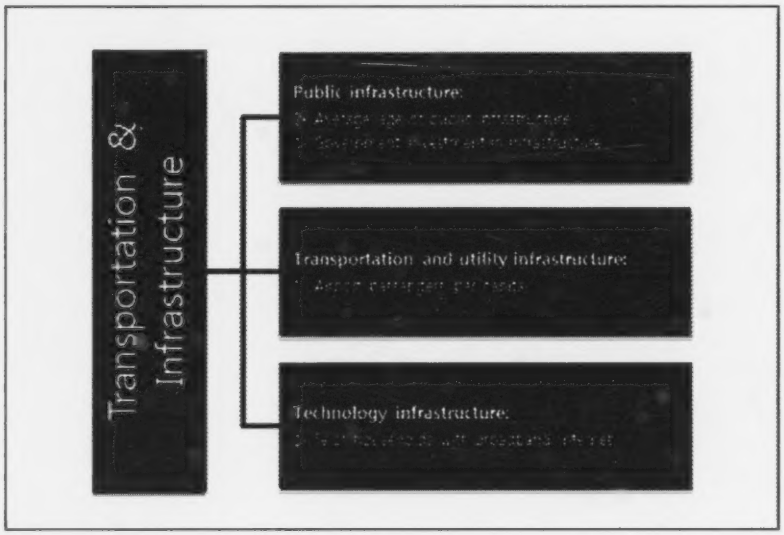
What is Alberta doing?

In an initiative to reduce business regulation, remove interprovincial trade barriers, and reduce the overall cost of business, the Government of Alberta has entered into the New West Partnership Trade Agreement (NWPTA) with the governments of British Columbia and Saskatchewan. This agreement created Canada's largest interprovincial free trade zone, with a market of almost 9 million people and a combined GDP of more than $555 billion.

The NWPTA came into effect on July 1, 2010, and builds upon the success of the former Trade, Investment and Labour Mobility Agreement (TILMA) between Alberta and British Columbia, extending the trade, investment, and labour mobility commitments to Saskatchewan. The goal of the NWPTA is to strengthen the economies of the three provinces by creating a more open and competitive marketplace.

- Within Canada, business costs in Alberta (Edmonton) are lower than Ontario (Toronto), but higher than in each of the other provinces compared. Manitoba and Saskatchewan have the lowest business costs, with a business cost index of 93.9 for Manitoba, and 94.0 for Saskatchewan. This result is due to Alberta's strong economy of recent years, which led to a much higher increases in business costs – especially labour, electricity, and facility costs – than seen in other provinces. These three cost factors tend to be strongly cyclical in Alberta, rising rapidly in boom cycles due to labour shortages, high demand for electricity, and strong real estate markets, but then moderating significantly during slower economic cycles.
- It is important to note that higher business costs only hurt competitiveness if they are not offset by higher levels of productivity. Thus, productivity growth matters, and Alberta's higher business costs coupled with its low rate of productivity growth is a cause for concern.

How it is measured



Infrastructure in an advanced economy includes three major components, all of which are compared in this report. These components, and their related measures, are summarized in the diagram, and described in the following paragraphs.

Public infrastructure represents the backbone of the province and its communities, and includes water and sewer pipes, wastewater treatment facilities, bridges, overpasses, public transit, highways, and roads. To measure the quality of such infrastructure, both the average age of infrastructure, and new dollars invested by government are compared.

Transportation and utility infrastructure represents a mix of public and private infrastructure. Public roads and highways are included in the measures of public infrastructure, listed above. Transport and utility infrastructure that are privately owned and operated (or possibly semi-publicly by Crown corporations) can include ports, pipelines, electrical transmission lines, railways and airports. This report includes one specific measure related to airports in each jurisdiction, reflecting the importance of air travel in an era of global labour mobility, plus a more general review of other aspects of transportation and utility infrastructure.

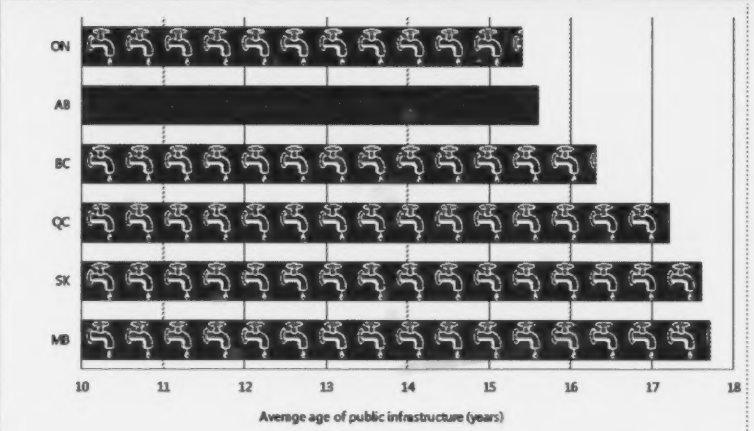
Technological infrastructure plays an important role in supporting the modern economy. This report examines a single measure in this regard – measuring the penetration of broadband internet in each jurisdiction.

How Alberta performs – public infrastructure

Age of public infrastructure

- Building and maintaining public infrastructure is a major role for all levels of government, and all jurisdictions have to deal with the maintenance issues that accompany aging infrastructure. Keeping abreast on infrastructure investments, and keeping the stock of infrastructure relatively new, are important strategies for avoiding deferred maintenance issues.
- Comparable data on the age of public infrastructure is only available within Canada, so the comparison for this measure is restricted to the six provinces.
- Alberta has the second-lowest age of infrastructure among the six Canadian provinces compared, behind only Ontario.
- Alberta's young infrastructure stock is consistent with the rapid growth seen by the province in recent decades. Since 2000, the Government of Alberta has placed significant emphasis on upgrading the province's infrastructure as the demands of economic growth have required better, safer, and newer infrastructure.
- Alberta's investments in infrastructure will pay dividends in multiple ways. High quality, modern infrastructure contributes to quality of life for individual Albertans, as well as facilitating both the ease and cost of doing business.

Average age of public infrastructure (2007)



Notes: Represents average age of all public infrastructure, including highways, roads, bridges, water systems, sewer and waste treatment systems. Data not available for international jurisdictions. Source: Statistics Canada Catalogue 11-621-MIE, *Age of Public Infrastructure: A Provincial Perspective*, Table 1.

What is industry doing in Alberta?

Recognizing that delivery of essential public infrastructure can be made more efficient through private sector involvement, Alberta firms have become active partners with government to design, build, finance, and maintain infrastructure.

Between 2007 and 2010, the private sector delivered 18 new Alberta schools to the government through a public private partnership Design Build Finance and Maintain (DBFM) contracting model. Business efficiencies achieved through this approach resulted in a two year acceleration in the completion date for these schools, and reduced the cost to government by $97 million.

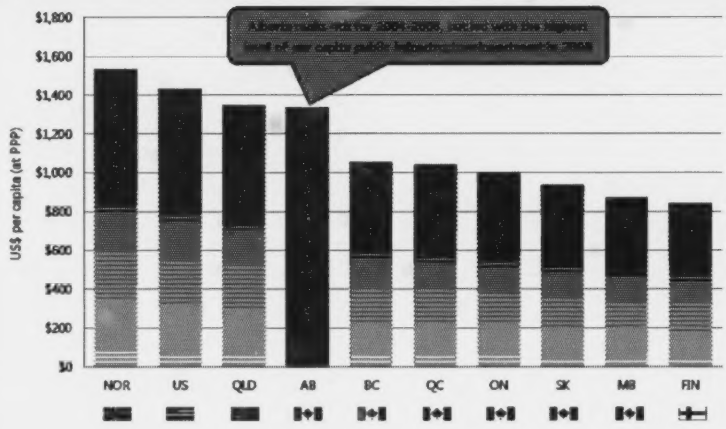
Based on this success, Alberta firms are now working on the delivery of 10 additional schools to government using the DBFM model.

- While age of infrastructure is a key competitiveness measure, the functionality, condition, and adequacy of infrastructure in meeting the needs of the local economy are also important indicators of infrastructure competitiveness. However, comparative measures for such indicators are currently not available across jurisdictions.

Government investment in infrastructure

- Government investment in infrastructure is essential to ensure that public infrastructure is suitably maintained and enhanced to meet the growing needs of the economy.
- Comparable data on new government infrastructure investments are available for all study locations, except for the six US states. National data for the United States are used in this comparison, reported per capita.
- Alberta ranks 4th among 10 jurisdictions for per capita investment in public infrastructure between 2004 and 2008, investing US$1,334 per person per year in new infrastructure.
- Only Norway, the United States, and Queensland exceeded this level of investment, and Alberta ranks well ahead of all the other Canadian provinces examined. In comparison, fourth-ranked British Columbia invested US$1,053 per person per year in infrastructure over the five year period – 21% less than Alberta.
- This high level of government investment in infrastructure correlates with the young age of Alberta's capital stock, as presented on the previous page.

Government investment in infrastructure, in US$ per capita at PPP (2004-2008)



Notes: Data represents government gross fixed capital formation in infrastructure. Data unavailable for US states. Sources: Statistics Canada CANSIM Table 384-0002; Queensland Treasury, State Accounts, Table 11; Statistics Finland PX Web Stat Database, National Accounts, Gross Fixed Capital Formation of industries; Statistics Norway, statistics subject 09-01, Annual national accounts, Table 1.

What is Alberta doing?

Government investment in quality roads and highways is important, but so too is the need to make the roads usable for commercial vehicles.

In this regard, Alberta is currently piloting a new streamlined permitting system for over-weight and over-dimension truck movements. Known as Traffic Routing and Information System (TRAVIS), this online system both issues permits for large vehicle movements, and also allows for monitoring of these movements by trucking firms, municipal authorities, and provincial regulators.

This new system is replacing an inefficient system that required trucking firms to apply for permits separately in each of the individual municipalities along their route.

How Alberta performs – transportation and utility infrastructure

Important aspects of transportation and utility infrastructure include roads and highways, ports, railways, pipelines, electrical transmission lines, and airports.

Roads and highways

- Since 2003, Alberta has sharply increased investment in transportation infrastructure to reduce traffic congestion and improve trucking efficiency. Major road projects under development include ring roads around Calgary and Edmonton, and twinning of the northern highway to Fort McMurray.
- In 2010-11, $1.9 billion is being spent by Alberta on the provincial highway network, and Alberta Transportation is also investing another $1.1 billion to support municipal transportation infrastructure projects.
- The assessment of investments in highways relative to other jurisdictions is implicit within the comparison of government investment in infrastructure presented on the previous page.

Ports and railways

- With its inland location, Alberta has no port facilities to compare. However, the province is served by Canada's two national railways, providing direct access for Albertan goods to ports located both on the West Coast and on the Great Lakes.
- Railways are especially important for the movement of bulk commodity goods in the agricultural, forestry, mining, and chemicals industries. Comparisons of railway effectiveness and cost need to be extremely specific to the commodity being moved, the origin, and the intended destination. Hence, measurement and analysis of railway issues are being addressed by sector-specific task teams relevant to the industries most dependent on rail service.

Utilities

- Natural gas and electricity infrastructure and utilities can have a significant impact on business cost competitiveness.
- As a major producer of natural gas in North America, Alberta has an abundant gas supply and very competitive natural gas rates for industry.
- Alberta's electricity system is owned and operated by a mix of investor and municipally owned companies. Alberta experienced a significant increase in electricity costs between 2003 and 2008 due to strong growth in demand. A rise in gas prices during that period also led to higher prices for electricity, as 40% of Alberta's electricity is derived from natural gas-fired generation. Since the fall of 2009, electricity prices in Alberta have declined, to become more competitive with jurisdictions across Canada and the United States.

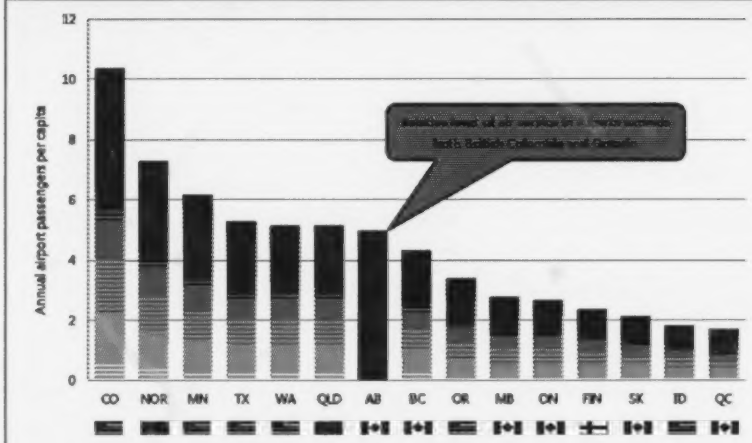
Pipelines

- Pipelines represent an important component of Alberta's infrastructure competitiveness, with oil and gas exports shipped by pipeline totalling $44.9 billion in 2009 – representing 58% of the total value of Alberta's exports.
- Between 2003 and 2009, industry invested more than $10 billion in pipeline projects in Alberta. Major new investments have also been made in the US to increase pipeline capacity for the export of oil and gas production from Alberta and Western Canada, and to open new US regional markets for these exports.
- In other jurisdictions, the existence of, and need for pipelines varies greatly among jurisdictions. Given this situation, no effective comparison measure exists for pipelines.

Airports

- Airports represent infrastructure assets that have become increasingly important in the era of globalized trade and higher international flows of skilled knowledge-economy workers. Indeed, for many technology companies, airport proximity and service can represent an important site selection consideration.
- Airports and air service for each jurisdiction are compared by measuring total annual passengers counts for airports with more than one million annual passengers. These passenger counts are then scaled per capita to indicate the range and frequency of air service available in each location, relative to population demand.
- Alberta ranks 7th among 15 jurisdictions on this measure – but the margin of difference between Alberta and fourth-ranked Texas is quite slim.
- Based on this measure of relative volume of air service, Alberta ranks ahead of all Canadian provinces, including Ontario and British Columbia – home to Canada's two major international gateway airports.
- Colorado holds a large lead on this measure, due to Denver International Airport being the main national and international hub for United Airlines. Similarly, Norway represents a major hub for air travel within the Scandinavian countries.
- By including only a single transportation infrastructure measure related to airports, this report does not imply that airports are the only (or even the most) important element of transportation infrastructure. Future consideration will be given to inclusion of additional transportation and utility infrastructure measures, if and when suitable measures can be identified.

Annual airport passengers per capita (2009)



Notes: Passengers per capita represent total annual airport passenger counts for each airport recording more than one million passengers per year in each jurisdiction, divided by the population of the jurisdiction. Sources: Passenger counts: Airports Council International North America, Brisbane Airport, Cairns Airport, Finavia, Avinor. Population estimates by state/province/country: national statistical agencies.

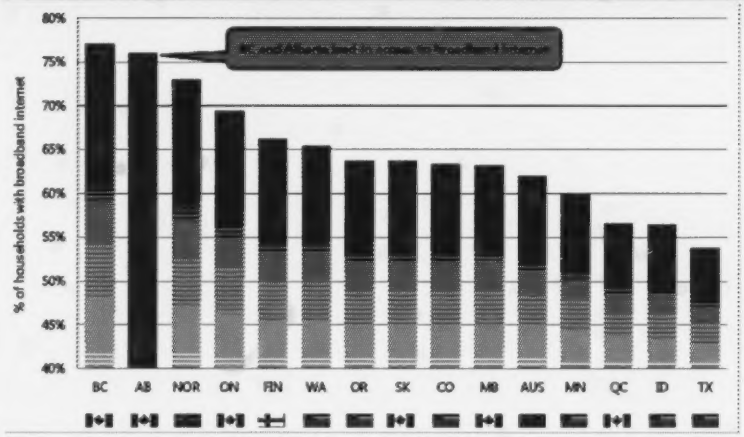
What is Alberta doing?

To promote competition and more consumer choice in air service, the Government of Alberta has been taking a leadership role in promoting the "open skies" concept with the Canadian federal government, and in 2009 hosted the inaugural Alberta Open Skies Forum. Air markets of particular interest to Alberta for expanded service include China, South Korea, Hong Kong, Mexico, United Arab Emirates, Japan, India, Brazil, and Australia.

How Alberta performs – technology infrastructure

- Technological infrastructure plays an increasingly important role in supporting the modern economy. While there are many important aspects of technological infrastructure, a widely distributed, high quality, broadband internet service has become essential to meeting the data needs of the modern economy.
- This report measures technological infrastructure by comparing the penetration of broadband internet into households in each jurisdiction.
- This measure reflects the relative stage of advancement of each jurisdiction's ICT infrastructure, as well as how ingrained use of the internet and ICT has become in everyday life in each jurisdiction – in other words, how "tech savvy" the population is.
- Alberta ranks 2nd among 15 jurisdictions for broadband internet access at home, and 2nd among the 6 Canadian provinces, behind only British Columbia.
- Lagging rates of broadband access in Idaho and Texas may seem surprising, but also reflect lower rates of overall internet usage in those states. More surprising is the slow uptake of broadband access in Quebec, given that in 2009 the percentage of Quebecers using the internet was marginally higher than for Albertans.

Percentage of households with broadband internet access (2008)



Notes: US results for 2008 represent the average of results from 2007 and 2009. Sources: Statistics Canada, *Survey of Household Spending in 2008*; US National Telecommunications and Information Administration, Networked Nation: *Broadband in America 2007* and *Current Population Survey Internet Use 2009*; OECD ICT database; Eurostat, *Community Survey on ICT Usage in Households and by Individuals, July 2010.*

What is Alberta doing?

In 2010, the Government of Alberta initiated the Final Mile Broadband Initiative to bring access to high speed internet to rural Albertans.

The Final Mile initiative has the objective of providing Albertans with broadband internet access, by early 2013, regardless of their place of residence.

This initiative follows from the successful completion of the Alberta SuperNet in 2005, which brought high speed distribution capabilities to most regions of the province and connected approximately 95% of provincial and municipal service locations to high speed internet.

One of the challenges that the Final Mile initiative is working to overcome is the establishment of internet service providers in remote areas to make the "final mile" connection between the home of individual Albertans and existing internet backbone infrastructure.

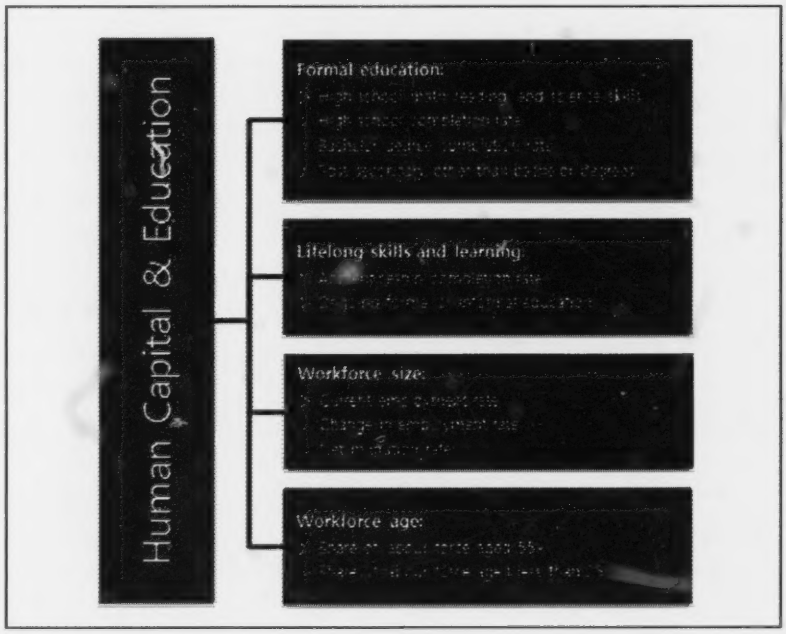
In addition to ensuring broadband internet access reaches all areas of the province, the Government of Alberta also recognizes the importance of equity of service quality and pricing for broadband internet service in different regions of the province. Within the constraints of Canada's telecommunication regulatory framework, the Government of Alberta is working to ensure that all residents of the province are able to access high quality broadband internet services at a competitive price.

Human capital and education

Human capital and education encompass the collective value of the knowledge, skills, and competencies of Albertans. Ensuring that there is a sufficient quantity of workers with the skills required in the economy is fundamental to increasing productivity and innovation.

Human capital and education are intrinsically linked with innovation in the Competitiveness Pyramid framework. As described in the Innovation chapter, this Human Capital and Education component of the Foundation deals with education and workforce development, while the Innovation level of the Pyramid focuses on the innovative outcomes from a highly educated and highly skilled workforce.

How it is measured



The education and development of human capital – the people who live and work in the economy – represents a complex, but important, topic for every advanced economy.

This report compares a total of 11 measures related to human capital and education, as detailed in the diagram. These 11 measures cover off four important themes – formal education, lifelong skills and learning, the size of the workforce, and the age profile of the workforce.

Formal education is the stage where core skills and knowledge are developed in the population, and thus in the workforce. The quality of education is measured using an international assessment of key math, reading, and science skills among high school students. Levels of education are measured by comparing the relative rates for completion of high school, completion of bachelor degrees, and for completion of post-secondary education other than bachelor degrees.

While formal education establishes core skills and knowledge, workplace skills development and lifelong learning are also important to building and maintaining human capital. These lifelong skills and learning are measured based on apprenticeship completion rates and adult participation in ongoing education.

In addition to education, the size of the workforce is another important aspect of human capital. In this regard, this report measures the current employment rate, recent changes in the employment rate, and net migration to the province.

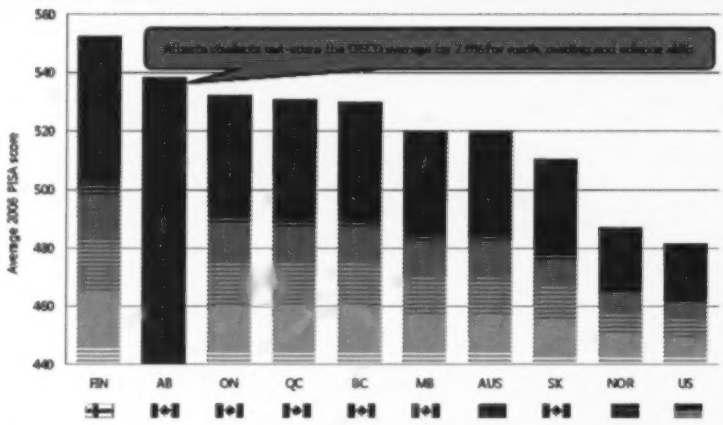
The final theme in this section is workforce age. This is an important issue in Alberta today, and in all advanced economies. To measure workforce age dynamics, this report compares the share of workers aged 55+ in the labour force, and the share of workers aged under 25.

How Alberta performs – education

High school skills

- The Program for International Student Assessment (PISA) is a worldwide evaluation of scholastic performance among 15 year old students. PISA assesses scholastic achievement in three key areas: mathematics, reading, and science.
- This program is coordinated by the OECD, with a view to improving educational policies and outcomes. The OECD publishes PISA test results on a national basis, and on a regional basis in a number of countries, including Canada.
- Standardized international PISA testing first took place in 2000, and is repeated every three years. The data from 2009 PISA tests will be released in December 2010.
- Alberta ranks 2nd among 10 jurisdictions based on the 2006 PISA test results, behind only Finland. Alberta students ranked 2nd for both reading and science skills (behind Finland), and 3rd for math skills (behind Finland and Quebec).
- This high score for Alberta reflects favourably on the future workforce of the province, with highly skilled students moving out of the high school system and into university, college, and/or the workforce. After all, if individual Albertans cannot compete with the world's best and brightest, neither can Albertan firms.

High school skills: test scores for mathematics, reading and science skills among 15 year olds (2006)



Notes: Results are not available for individual US states. Reading scores were not reported for the United States in 2006, so the US result represents the average of scores for mathematics and science only. This variation is not expected to influence results and most countries show similar scores for all three skill areas (variations of less than 20 points on a scale where the OECD average score equals 500 points). Sources: OECD Program for International Student Assessment.

What is Alberta doing?

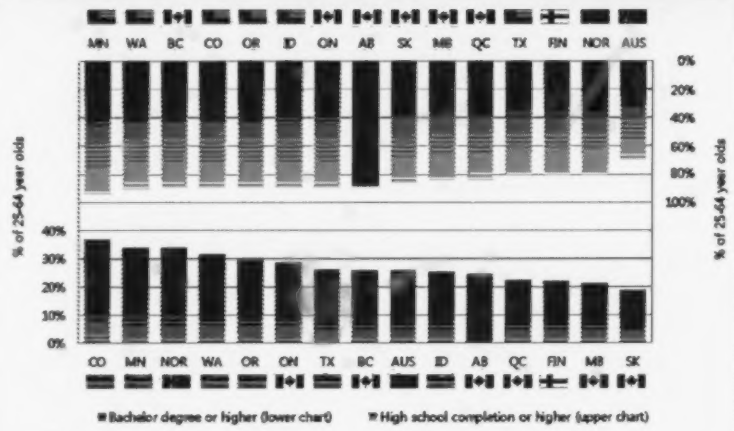
The Government of Alberta has recently redesigned its school curriculum development process, and a new Education Act is being introduced for 2011. The new Act is intended to allow the Province, schools boards, and the community to be more responsive in adapting curriculum to societal, economic, and technological changes.

Alberta has also developed an Education Workforce Planning Framework for Action to address emerging demands in the Alberta education sector workforce through to 2014. Teacher shortages are expected in some areas, and this initiative is working to avoid such shortages by ensuring that Alberta has the right number of teachers with the right skills, in the right place, at the right times. Complementing this process, a new Teacher Workforce Information System is being developed to improve the ability of the Province and school districts to describe the education sector's workforce characteristics, and to diagnose supply and demand trends.

Education attainment

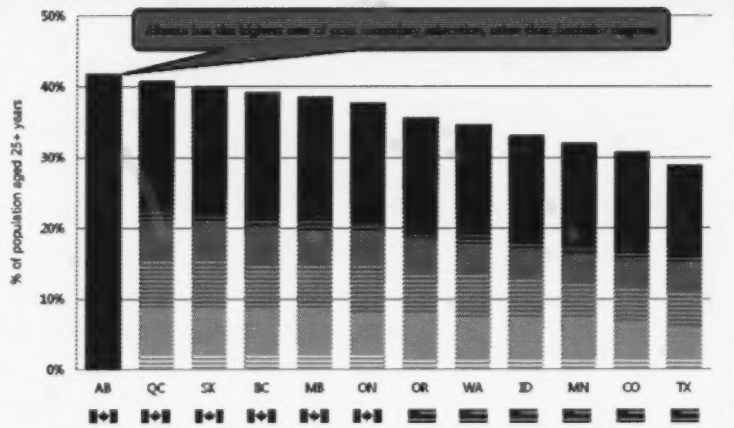
- Completion of formal education – high school and/or post-secondary – is a core objective of the education system.
- Comparing jurisdictions based on their high school completion rates (upper half of the top chart), US states fill five of the top six rankings, with British Columbia breaking this line-up to rank third.
- Alberta ranks 8th among 15 jurisdictions, and 3rd among the Canadian provinces, with a high school completion rate that exceeds the average of the 15 locations.
- Resource sector job opportunities are often cited as a cause of young Albertans leaving school early. However, it is notable that Alberta's rate of high school completion exceeds Saskatchewan, Manitoba, and Quebec.
- For completion of bachelor degrees (or higher), Alberta also ranks 3rd among the 6 Canadian provinces, but 11th among the 15 jurisdictions.
- Finally, for all other forms of post-secondary education, from completion of "some coursework" through to completion of diplomas apprenticeships, and associate degrees, Alberta leads among the 12 US and Canadian jurisdictions examined. This measure encompasses many different forms of education and training, but the positive result reflects the strength of Alberta's workforce in terms of technical and vocational education.

Educational attainment: high school and bachelor degree completion among 25-64 year olds (2008)



Sources: Statistics Canada, CANSIM Table 282-004; US Census Bureau, *American Community Survey, 1- Year Estimates*; OECD, *Education at a Glance 2010*, Tables A1.2 and A1.3.

Educational attainment: post-secondary education other than bachelor and higher degrees among the population aged 25+ (2009)



Notes: Includes all forms of post-secondary education from completion of some training, through to completion of certificates, diplomas and associate degrees. Comparable data not available for Australia, Finland, and Norway. Sources: Statistics Canada, CANSIM Table 282-004; US Census Bureau, *American Community Survey, 1- Year Estimates*.

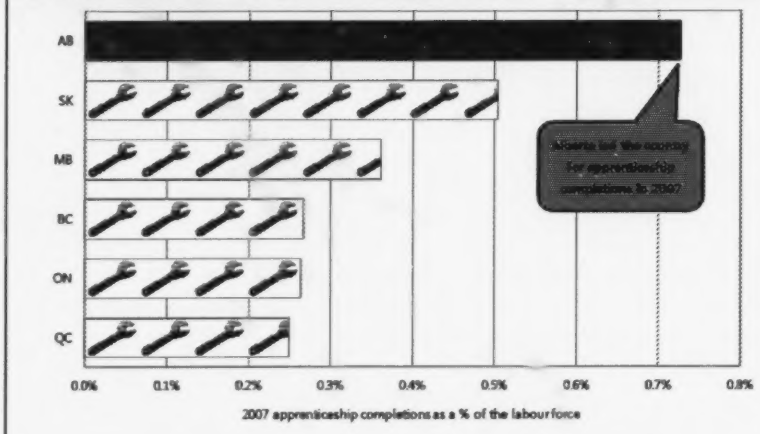
- Considering educational attainment overall, Alberta fares relatively well within the Canadian context, and particularly well for non-degree post-secondary education. However, Alberta lags the comparator US states for both high school and bachelor degree completion.

How Alberta performs – lifelong skills and learning

Apprenticeship completion rate

- For a competitive economy, the ability of workers to take theoretical knowledge and apply it on the job is vital. Apprenticeship training links education to direct job skills, and on this measure Alberta rates particularly well.
- Measured as a percentage of the workforce, Alberta's rate of apprenticeship completion in 2007 was almost 50% higher than in Saskatchewan (the second-ranked province), and nearly three times the apprenticeship completion rates in Ontario or Quebec.
- Clearly, the resources sector in Alberta does provide a strong incentive to follow a trades career path out of school, making this strength in Alberta's technical workforce development especially important. The high rate of apprenticeship completions in Alberta indicates the responsiveness of training opportunities to the needs of the provincial economy.

Number of apprenticeship completers as % of the labour force (2007)



Sources: Statistics Canada *National Apprenticeship Survey 2007*, Catalogue 81-598X, Individual Provincial Overview Reports, Table A.1.1.2, and CANSIM Table 282-0002 (Labour force).

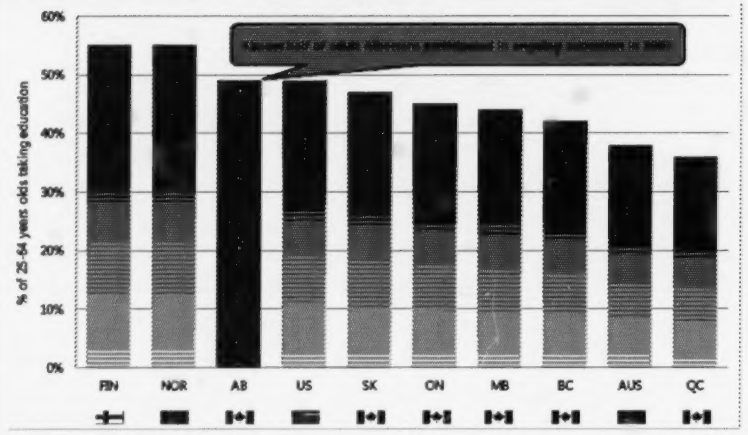
What is Alberta doing?

The Achievement in Business Competencies Program, also known as the Blue Seal Program, was established by the Alberta Apprenticeship and Industry Training Board to encourage and recognize business training. Certified Alberta journeypersons in a designated trade or occupation can earn a Blue Seal to develop business skills and help succeed in business. Many Alberta post-secondary institutions and industry associations have approved programs of study in a variety of subject areas. This business training serves a variety of careers needs. It can be the basis for advancement in a company, increased management responsibilities, or the foundation for those wishing to become self-employed.

Lifelong learning

- In today's knowledge-driven global economy, lifelong learning has become a factor of critical importance, both for economic competitiveness and personal career development.
- Lifelong learning can take place either through formal education, such as adults returning to university to earn a higher degree, informally in the workplace, or through knowledge sharing in business networks.
- Alberta's rate of participation in lifelong learning activities in 2008, at 49%, matched the US average and exceeded every other Canadian province. Only Finland and Norway exhibited a stronger commitment to lifelong learning, with both countries reporting 55% of 25-64 year olds participating in some form of ongoing education in 2007.
- In comparison, results for the other Canadian provinces range from 47% in Saskatchewan to 36% in Quebec.
- Australia ranks relatively poorly on this measure, with only 38% of adults participating in ongoing education.

Lifelong learning: 25-64 years olds taking formal or informal education (2007-08)



Notes: Data for Canadian provinces are 2007, all other jurisdictions are 2008. Data for Queensland represents the Australian average. Data not available for individual US states. Sources: OECD, *Education at a Glance 2010*, Indicator A5, Table A5.1b; Statistics Canada, *Education Indicators in Canada, An International Perspective, 2010*, Catalogue no. 81-604-X Table: C.3.1.

What is industry doing in Alberta?

Alberta industry has been active in the development of business networks designed to foster sharing and learning among members, and to boost competitiveness and productivity. Some examples of industry-initiated networks include:

- Calgary Manufacturing Action Committee
- Central Alberta Regional Manufacturing Association
- Greater Edmonton Manufacturing Cluster
- Alberta Venture Group
- Construction Owners Association of Alberta

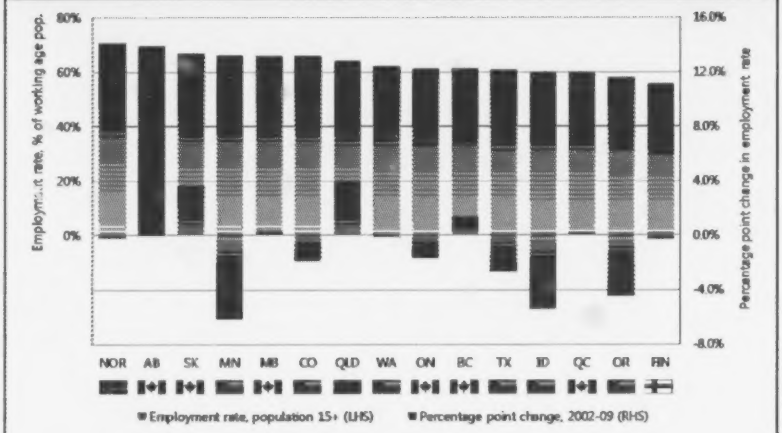
As an example of learning-oriented initiatives being undertaken by industry networks, the Calgary Manufacturing Action Committee, in partnership with the Southern Alberta Institute of Technology, is in the process of developing both a productivity certificate program for managers and a high-school level pre-apprenticeship program.

How Alberta performs – workforce size

Employment rate

- The employment rate is a key measure of workforce dynamic, reflecting the percentage of the adult population that is actively employed. While the employment rate is influenced by short term unemployment rates, in the long term employment rates are reflective of labour force vibrancy – assessing whether adults are motivated to be part of the workforce and be actively employed. A strong employment rate also acts as a magnet to help attract talent from other jurisdictions.
- For this analysis, the employment rate has been measured based on total employment as a percentage of the population aged 15+ (16+ in the US). This measure does not exclude seniors (65+), recognizing the existence of employment among this group – a trend that anecdotal reports suggest is increasing.

Employment rate in 2009, and change since 2002



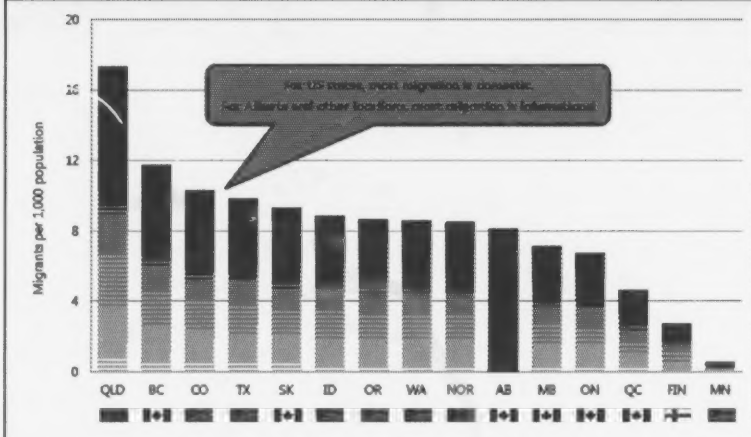
Notes: Employment rate for US states is measured as a percentage of the population aged 16+, as compared to 15+ in all other jurisdictions. This has a marginal positive effect on US numbers, due to the low percentage of 15 year olds who are working in all other countries. Sources: Statistics Canada, Labour force survey estimates, Table 282-0002; Bureau of Labour Statistics, Annual average state-wide data, Employment status of the civilian non-institutional population in states; Eurostat, Employment rates by age; Australian Bureau of Statistics, Publication 6202.0 Labour Force Australia, Table 12.

- In 2009, Alberta ranked 2nd among the 15 jurisdictions for its employment rate, with 69.4% of the population aged 15+ actively employed – reflecting Alberta's long tradition of representing a hard-working society. On this measure, only Norway leads Alberta.
- Minnesota, Idaho, and Oregon have seen the biggest decreases in their employment rates since 2002 – with drops of more than four percentage points over the last seven years. These rates correspond with increases in unemployment in these states, suggesting that the decline in employment represents the inability to create jobs for labour force participants, rather than a shrinking of the economically active population.
- The change in Alberta's employment rate between 2002 and 2009 was marginal – growing just 0.3 percentage points. This low increase is partially explained by Alberta's existing high rate of employment, as it becomes much harder to generate further increases in employment as natural limits on labour participation are reached. This is why Alberta cannot rely on more people working more hours to sustain future prosperity, but instead must work to improve labour productivity.

Net migration

- The Government of Canada has identified that immigration will soon represent the sole source of Canada's workforce growth, due to low natural population growth. Given this reality, both the ability to attract and retain immigrants and the ability to increase labour force productivity are of key importance for competitiveness and future sustained prosperity.
- This measure compares net migration for each jurisdiction, by examining international migration for Finland and Norway, and international plus domestic migration for the states and provinces in Australia, Canada, and the US. (International labour mobility within Europe provides Finland and Norway with the equivalent to domestic migration within Canadian, Australian, and US states and provinces.)
- Alberta ranks 10th among the 15 jurisdictions for its rate of net migration over the last three years – attracting 8.1 net migrants per 1,000 population. Within the same three year time period, Queensland attracted more than double the migrants of Alberta, at 17.3 migrants per 1,000 population, while British Columbia attracted 11.7 migrants per 1,000 population.
- For US jurisdictions, domestic migration generally represents the primary source of migrants, whereas for all Canadian jurisdictions, international migrants significantly outnumber domestic migrants.

Net migration rate per 1,000 population (2007-09)



Sources for migration statistics: Statistics Canada, CANSIM Table 051-0004; US Census Bureau, Population Division, Table 5. *Estimates of the Components of Resident Population Change for the United States, Regions, States, and Puerto Rico*; Statistics Norway StatBank, Subject: 02 Population, Table: 05426; Statistics Finland PX Web Databases, Population, Migration, *Immigration and emigration by age, gender and area*; Australian Bureau of Statistics, Catalogue 3101.0 Table 2, as reported by Queensland Office of Economic and Statistical Research. Population: National statistical agencies.

What is Alberta doing?

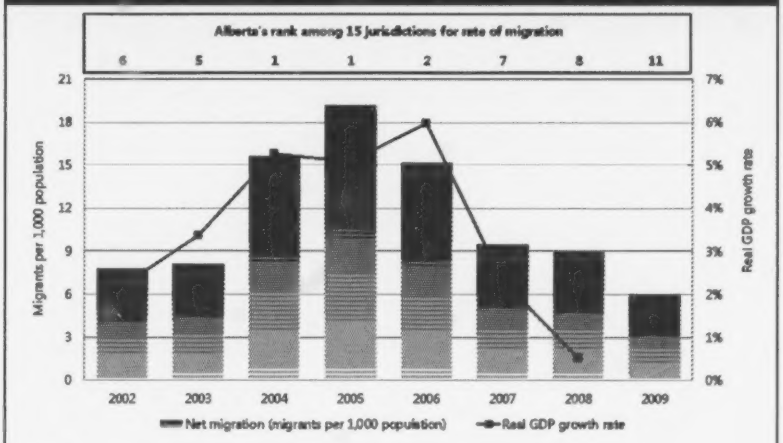
Given the significance of immigration to maintaining and growing Alberta's labour force, the Government of Alberta is actively working to shape Alberta's immigration, even though immigration represents an area of shared federal/provincial jurisdiction in Canada.

In 2002, in partnership with Citizenship and Immigration Canada, Alberta developed the Alberta Immigrant Nominee Program to give the province more control over selecting immigrants to the province and to fast track applications. Since its launch, the number of provincial nominees destined for Alberta has grown from 168 in 2002 to 10,777 in 2009.

Alberta is working with other provinces to influence the Canadian immigration system in areas such as the mix of occupations accepted, foreign credential recognition, and settlement and integration services. In 2007, Alberta launched an international immigration marketing strategy, working with employers to identify where they can find and attract the right people with the right skills at the right time. New initiatives in occupational health and safety, labour standards, and workplace diversity play an important role in supporting Alberta's reputation an attractive destination for immigrants.

- Alberta's rate of net migration is highly responsive to the provincial and national economic situation. As this chart demonstrates, there is a direct correlation between Alberta's rate of economic growth and its rate of net migration. Indeed, when the provincial economy was booming in 2004 and 2005, Alberta had the highest rate of net migration among the 15 jurisdictions compared.
- These results suggest that although immigration flows are working in Alberta's favour, increased numbers of immigrants may not fully meet labour demands if these immigrants do not possess required skills and do not land in Alberta at the right time. In addition, demographic pressures in all developed countries are likely to significantly increase global competition for skilled workers.

Trend in Alberta's net migration (2002 to 2009)



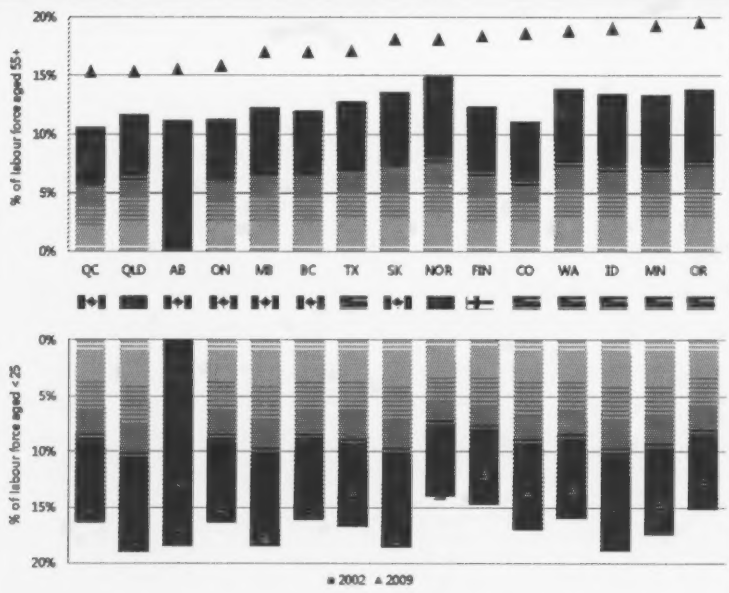
Sources: Statistics Canada, CANSIM Tables 051-0004 (migration) and 384-0002 (real GDP).

- While immigration is an important source of workforce growth, interprovincial migrations flows are also an significant factor. Interprovincial migration peaked during 2006 with a net gain of 46,329, followed by a dramatic decline with only 1,101 in 2009. A rebound in Alberta's economy may not necessarily correspond with a rebound in net interprovincial migration growth if economic conditions improve in traditional source provinces.
- The data presented here on immigration flows only includes new permanent residents in each jurisdiction. In addition to migration of permanent residents, Alberta also makes significant use of temporary foreign workers to help balance shortages of both general labour and specific skills.
- In 2009, 28,610 temporary foreign workers were destined to Alberta, representing 16% of the national total. Among the foreign workers arriving in Alberta in 2009, the top 20 major occupational groups included food service workers; farm workers; professional professional occupations in business services; truck drivers; steamfitters, pipefitters, and sprinkler system installers; and mechanical engineers – reflecting the diversity of needs that this program can fill.

How Alberta performs – workforce age

- To assess the issue of workforce age dynamic, this analysis compares the relative share of the workforce in 2002 and 2009 for two key sections of the labour force – older workers and younger workers.
- Workers aged 55+ represent those employees nearing the end of their careers, and who will soon be leaving the labour force. Alberta had the third *lowest* share of workers aged 55+ in 2009, with 15.5% of its workforce in this age group. This result ranks Alberta marginally behind Quebec and Queensland.
- While the share of older workers in Alberta has jumped from 11.2% of the workforce in 2002 to 15.5% in 2009, all jurisdictions saw their relative share of older workers rise over that time period. Norway, Queensland, and Texas were the only jurisdictions that experienced lesser increases in their share of older workers than Alberta.
- Workers aged under 25 represent those employees starting out in their careers, and ready to move up in their careers as they build their skills. In 2009, Alberta had the fourth *highest* share of workers aged <25 among the 15 jurisdictions, with 17.0% of its workforce aged <25 – ranking behind only Queensland, Saskatchewan and Manitoba.
- Between 2002 and 2009, all locations saw the relative share of younger workers in the workforce decline, although Alberta's decline was slightly below average in this regard.

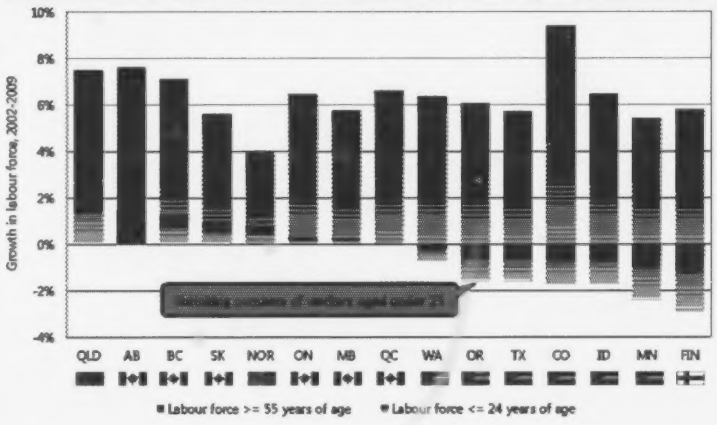
Growth of labour force aged 55+ and <25 (2002 and 2009)



Notes: Labour force aged <25 represents 15-24 year olds in all locations except for the US states, for which it represents 16-24 year olds. Sources: Statistics Canada, CANSIM Table 282-0002; US Bureau of Labour Statistics, *Local Area Unemployment Statistics, Data Tables*; Eurostat data table lfsa_pganws: *Population by sex, age groups, nationality and labour status*; Queensland derived from Derived from Australian Bureau of Statistics Publication 6202.0 Table 12, and SuperTable ST GM1: *Gross Flows by State, Age, Sex, Table 1.*

- The previous chart showed that Alberta, like all jurisdictions, saw its *share of workers* aged under 25 years decline between 2002 and 2009; however, this chart demonstrates that Alberta still saw an increase in the *total number* of younger workers – thanks to the province's strong labour force growth over that period. Indeed, Alberta saw the second highest rate of growth in its number of young workers – behind only Queensland.
- Also due to the province's strong labour force growth, Alberta saw the second highest rate of growth in its number of older workers between 2002 and 2009, even though it ranks third among jurisdictions for its low relative share of older workers in the workforce.
- Of interest in this chart is the separation of results by country. All US states, and Finland, saw declines in their absolute numbers of young workers between 2002 and 2009, while Queensland, Norway, and all Canadian provinces except Quebec saw an increase in their number of young workers. This may be, in part, due to younger workers in the United States either going back to school or giving up looking for work as a result of the protracted and deep recession suffered by the US during 2008-09.
- Overall, Alberta has a relatively young labour force, helped in part by strong immigration. While population aging remains an issue for Alberta, the province is generally better positioned than comparator jurisdictions in terms of workforce age dynamic.

Growth of labour force aged 55+ and <25 (2002-2009)

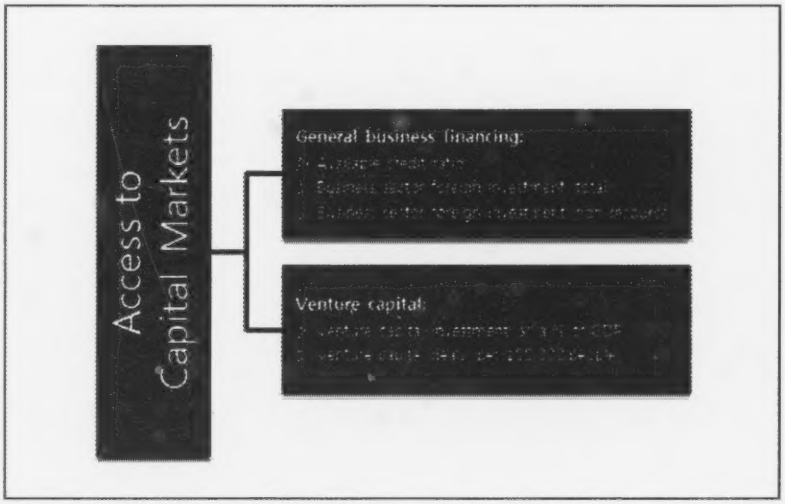


Notes: Labour force aged <25 represents 15-24 year olds in all locations except for the US states, for which it represents 16-24 year olds. Sources: Statistics Canada, CANSIM Table 282-0002; US Bureau of Labour Statistics, *Local Area Unemployment Statistics, Data Tables*; Eurostat data table lfsa_pganws: *Population by sex, age groups, nationality and labour status*; Queensland derived from Derived from Australian Bureau of Statistics Publication 6202.0 Table 12, and SuperTable ST GM1: *Gross Flows by State, Age, Sex, Table 1.*

Access to capital markets

How it is measured

Access to capital represents a vital issue for businesses of all sizes. From start-up entrepreneurs seeking seed capital to major corporations looking to finance mega-projects, access to capital influences the ability of the economy to prosper at every level.



As illustrated in the diagram, this report includes five measures for access to capital, under two broad themes.

The general business financing theme measures the availability of authorized credit, and the degree of foreign investment in the economy – both in total and specific to the resource sector.

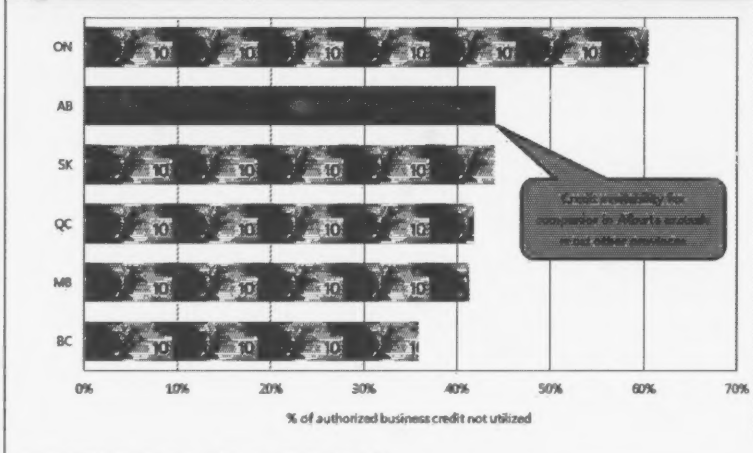
The venture capital theme measures both the value of venture capital investments made in a year, expressed as a percentage of GDP, and the number of venture capital deals made, expressed relative to the population.

How Alberta performs – general business financing

Available credit ratio

- Credit availability is measured as the percentage of authorized loans that businesses have not drawn upon. This available credit provides flexibility to companies in managing their operations, as they have pre-authorized credit they can draw upon quickly if required.
- Alberta ranks second, behind Ontario, for the percentage of authorized commercial debt currently available to companies in Canada. This gives companies in Alberta greater financing flexibility than in most other provinces.
- The high credit availability in Ontario is most likely attributable to authorized credit being held by corporate head offices in Toronto.

Available credit ratio (2008)

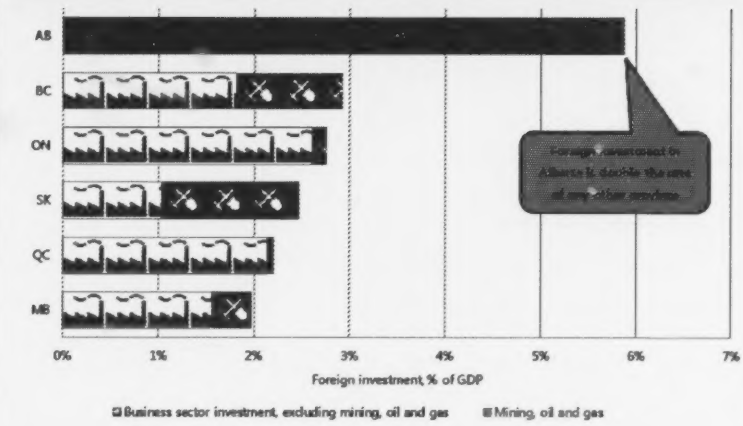


Source: Statistics Canada, *Survey of Suppliers of Business Financing*.

Foreign capital investment as percentage of GDP

- This measure shows the relative attractiveness of jurisdictions for major foreign investments in productive assets. It includes investments in projects by subsidiaries of foreign companies, but excludes foreign investments in mergers, acquisitions, or other "paper" investments.
- In terms of total foreign investment in all business sectors, Alberta leads the country by a wide margin, with foreign investment in 2008-2009 averaging 5.9% of GDP, as compared to 2.0% to 2.9% for all other provinces compared.
- More than 70% of this investment is concentrated in the mining, oil, and gas industries, meaning that Albertan firms in other sectors find it more challenging to attract foreign investment. Excluding the mining, oil, and gas industries, Alberta ranks fourth among the six provinces for foreign investment into other business sectors.

Business sector foreign investment, percentage of GDP (2008-2009)



Notes: Business sector foreign investment includes investment by foreign firms and foreign-owned Canadian subsidiaries in structures, machinery, and equipment. Business sector includes all sectors of the economy except education, healthcare, public administration, and residential dwellings. Source: Statistics Canada 61-232-X, *Foreign & Domestic Investment in Canada - 2008 to 2010.*

Raising equity in Alberta

Raising equity directly from the public represents the most common financing route of venture-stage mining, oil, and gas companies, and the ability to raise such venture equity is of vital importance to Alberta firms.

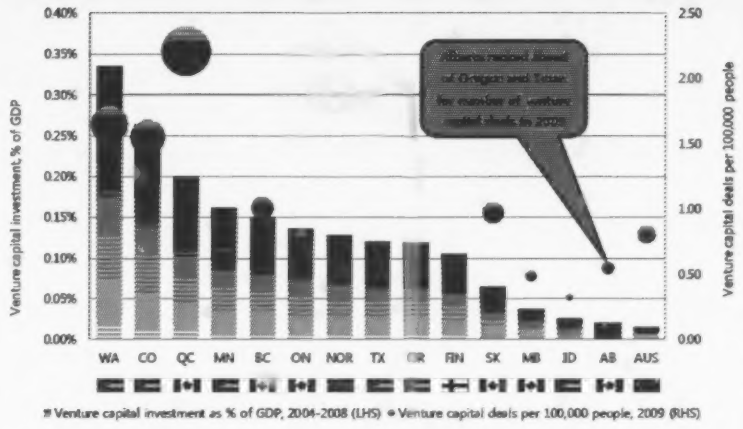
The TSX Venture Exchange (TSXV) is headquartered in Calgary, with operations in Calgary and Vancouver. The TSXV has clearly established itself as the world leader for raising venture-stage public equity for resource companies.

For example, in 2009 TSXV had 251 oil and gas companies listed on its board, more than any of the Toronto (TSX), London (LSE), London Venture (AIM), Australian (ASX), NYSE Amex, or Nasdaq exchanges. In 2009, TSXV saw 18 new oil and gas listings – three times more than any of the exchanges listed above – and placed 186 new financings for oil and gas firms (again, higher than any of the other exchanges). In total, TSXV raised $1.4 billion in equity for oil and gas firms in 2009.

How Alberta performs – venture capital

- Venture capital fills a critical niche in supporting the development of innovative companies, helping to bridge the gap between early individual investors and an initial public offering.
- Venture capital invested as a percentage of GDP measures the value of new investments that have been made to support Alberta companies. This measure is assessed over a five year average, using data from 2004 to 2008.
- Based on this measure, Alberta ranks 14th among 15 jurisdictions, ahead only of Australia. Despite this poor ranking, Alberta's pool of venture capital has improved in recent years. Looking at 2008 alone (instead of the five year average), Alberta ranked 13th among the 15 jurisdictions.
- The second measure used to assess venture capital activity is the number of venture capital deals per 100,000 population. Based on deals closed in 2009, Alberta ranks ninth among the 13 jurisdictions for which data are available, ranking ahead of Manitoba, Oregon, Texas, and Idaho.
- Results for these measures reflect the nature of different industries in each jurisdiction. Venture capital plays a significant role in the development of high tech start-ups, as commonly seen in the leading jurisdictions including Washington, Colorado, Quebec, and Minnesota. By way of contrast, resource oriented start-ups are generally more reliant on traditional debt and equity markets, even for early stage capital.

Venture capital investment, % of GDP (2004-2008) and number of venture capital deals per 100,000 population (2009)



Notes: Date represents venture capital only, and does not include private equity. Data is not available for number of deals in Finland and Norway. Sources: .Canadian Venture Capital & Private Equity Association, Annual Statistics Review, Table 4; PricewaterhouseCoopers/National Venture Capital Association, MoneyTree Report; Eurostat Table tsiir080, Venture capital investments by type of investment stage; Australian Private Equity & Venture Capital Association, Yearbook 2009 Data, Table 3.

What is Alberta doing?

To improve the availability of venture capital for innovative Alberta companies, in 2008 the Province established the Alberta Enterprise Corporation as a venture capital investment vehicle for the Province.

With initial funding of $100 million, Alberta Enterprise Corporation is authorized to co-invest in early stage venture capital funds, thus effectively representing matching capital for private investors.

What is industry doing in Alberta?

Angel investors are individuals or groups who provide capital for business start-ups and innovation investments. Angel investors play a significant role supplying Alberta businesses with the capital they need to become high performing, high growth businesses.

A small but growing number of angel investors organize themselves into angel groups, or angel networks to share research and pool their investment capital. VentureAlberta Forum and Alberta Deal Generator are two of the largest gatherings of business angels in Calgary and Edmonton, and represent communities of members with backgrounds in oil and gas, ICT, biotech, real estate, health and life sciences, hospitality, and transportation.

Appendices

Appendix A	Task team update – agriculture (grains and oil seeds)
Appendix B	Task team update – financial services
Appendix C	Task team update – manufacturing
Appendix D	Task team update – petrochemicals
Appendix E	Labour productivity by industry

Appendix A Task team update – agriculture (grains and oil seeds)

Sector profile

Alberta's farmers are stewards for 52.1 million of Alberta's 157.7 million acres of land. They produce massive exportable volumes of wheat, malting barley, canola seed, field peas and oats. Some have also diversified into differentiated products such as small grains and organic grains. Under the competitiveness initiative, the agriculture task team will focus on the grain and oil seeds sector.

Summary statistics – grains and oil seeds

	2005	2006	2007	2008	2009	Average
Farm Cash Receipts ($ billions)	2.8	3.1	4.2	6.2	5.3	4.7
# of Employees (thousands)[1]	7.7	8.3	7.9	9.0	10.0	8.6
% of Alberta GDP	2.6	2.2	2.2	2.6	2.1	2.3
Value of Exports ($ billions)	2.1	2.7	3.4	5.3	4.7	3.7

1 Excludes milling

Benchmark data

Yield was chosen as a benchmark because comparable data are readily available and reflect both the level of and the rate of technology adoption by farmers. Grains and oilseeds yields are greatly affected by climate, soil type and a host of other agronomic factors, so to minimize the influence of these factors on the yield measure, the rate of growth in yield is used for benchmarking for the period 1990-2009.

Alberta appears to have performed relatively well in canola yield growth even in comparison to soybean yield growth rate in the US and Australia. The same is true for wheat, where Alberta's yield growth is the highest. Where Alberta fares relatively poorly is in barley where, except for Ukraine, yield growth has been the lowest.

Average annual growth rate in yield (%, 1990-2009)

Jurisdiction	Canola	Soybean	All Wheat	Barley
Alberta	1.53	–	1.12	0.17
Canada	2.16	-0.15	1.06	0.50
USA	0.81	1.35	0.62	1.40
Australia	0.08	0.98	-0.10	0.88
Argentina	1.69	-0.81	-0.43	1.08
France	1.38	0.96	0.74	0.98
Ukraine	-0.19	1.83	–	-1.15

Areas of competitiveness focus

Marketing choice

The Canadian Wheat Board's (CWB) monopoly over wheat and malt barley has been highlighted by sector stakeholders as the largest obstacle to improved competitiveness. Studies have shown differences between CWB returns to producers and what producers could have obtained from the free market. The CWB is federally legislated. Alberta's government and producers have invested considerable resources in efforts to end the CWB monopoly. While these efforts have brought about some reforms, Alberta needs to continue to work with the Alberta Grain Council, other producer organizations, other provinces and the federal government to further develop options for marketing choice.

The regulatory burden

The regulatory burden is frequently mentioned within the Alberta agri-food sector as a cost and a disadvantage in comparison to other jurisdictions. A number of specific issues pertaining to the grains and oil seeds sector will be reviewed, including dealing with regulations that require interprovincial collaboration and trans-border harmonization (e.g., trucking regulations across Western Canada).

Research and innovation

Research and innovation underpin competitive success. Changing consumer preferences and societal demands imply that the producers who are able to adopt innovation will have a competitive advantage. For example, regulated crops such as wheat and barley have shown limited innovation while canola and pulses have advanced significantly in terms of technology, marketing and business innovation.

Rural renewal

The farming business and lifestyle has not been attractive enough to encourage youth to follow in the footsteps of their farming parents. As a result, Alberta's farmers are, on average, getting older.

A large percentage of Alberta's farmland is rented from retired farmers or their heirs. One area of focus will consider immigrant farmers as an option to address the demographic gap.

Agri-food policy evolution

There is a growing recognition that the current approach to supporting the agri-food sector is not improving competitiveness. Expenditures aimed at research, environmental opportunities, and infrastructure continue to be dwarfed by farm income support programs. The Agriculture Task Team will work with the Ministry of Agriculture and Rural Development (ARD), Agriculture Financial Services Corporation (AFSC) and producers to support the development of the next national policy framework (Growing Forward 2).

Appendix B Task team update – financial services

Sector profile

The financial services industry (FSI) is one of Alberta's key growth sectors. It includes more than 4,200 firms that manage over $100 billion of financial assets, facilitate more than $75 billion in capital investments, contribute over $8.13 billion to the province's economy, and provide a significant share of the province's knowledge-based employment. The province of Alberta is also home to the headquarters of a significant number of large financial institutions and the site of a world-calibre oil and gas financing cluster. Under the competitiveness initiative, the mandate of the financial services task team includes: banking and credit intermediation, securities, commodities and investments, insurance carriers, agents and brokers, funds and other financial vehicles.

Summary statistics

	2005	2006	2007	2008	2009	Average
Revenues[1] (in billions of dollars)	13.2	15.2	16.8	17.2	16.5	15.8
# of Employees (thousands)	61.5	60.8	63.2	72.5	68.8	65.4
% of GDP	3.8	4.1	4.4	4.6	4.8	4.3

Source: Statistics Canada.

1 2007 – 2009 are estimates that were derived by AFBE.

Sector benchmark data

Key Indicator	Alberta Performance	Jurisdiction Comparison[1]	Assessment
Real GDP Growth (CAGR[2] 2004-2008)	8.9%	Alberta is ranked 1st of 9 jurisdictions (average annual growth 3.7%)	Alberta's Financial Services Industry has been one of the fastest growing sectors in the province's economy in recent years. Both GDP and employment have been growing faster than in comparator jurisdictions and above the growth rate of the overall economy. However, opportunities for future growth remain as the sector's share of the provincial GDP is still the second lowest of all the comparator jurisdictions.
Employment Growth (CAGR[2] 2004-2009)	3.6%	Alberta is ranked 1st of 9 jurisdictions (average annual growth 1.0%)	
Share of provincial GDP, 2008	4.6%	Alberta is ranked 8th of 9 jurisdictions	

Source: Statistics Canada, U.S. Bureau of Labor Statistics, U.S. Bureau of Economic Analysis, latest available economic data.

1 Comparative jurisdictions include: British Columbia, Ontario, Quebec, Colorado, Illinois, Massachusetts, New York, and Texas.

2 Compound Annual Growth Rate.

Areas of competitiveness focus

There is a significant opportunity for Alberta's Financial Services Industry to strengthen and expand from its world class expertise in investment management and energy financing. Building upon the current and future investments on the province's energy resources base and supporting industries, Alberta's FSI offers a great opportunity for further diversification of the economy and the creation of highly skilled jobs for Albertans.

Work conducted to date by the financial services task team indicates that for Alberta to capitalize on these opportunities, focused efforts are required in four main areas:

- **Industry-government collaboration** – A survey of successful financial centres around the world shows that the establishment of formal mechanisms for public-private collaboration plays a central role in upgrading FSI competitiveness. One model that has proven successful in other jurisdictions is the formation of public-private organizations to track and share information on industry performance and leading practices, as well as to identify threats and opportunities as they emerge. Alberta does not currently have a formal mechanism to streamline the dialogue between financial services firms, academia, and all levels of government.
- **Industry profile** – Alberta currently lacks a strategy to clearly brand, market and communicate the province's strong value proposition as a prime destination for global financial services talent, firms and capital (e.g., dynamic and growing economy, quality of life, access to markets, sophisticated talent, niche expertise in energy-finance services). Such efforts will require a coordinated approach across multiple channels, including government, industry, and post-secondary institutions.
- **Business environment** – Alberta is competing with jurisdictions across Canada and around the world to attract and retain global financial services firms, talent, and capital. To compete successfully, the province must maintain a stable and supportive business environment. This means maintaining current positive policies while considering new and innovative approaches to address emerging opportunities and issues in the global financial markets (e.g., regulatory and tax environment and human capital development).
- **Human capital** – The availability of skilled employees is a key driver to sustain competitiveness in the talent-oriented financial services industry. Addressing Alberta's current needs requires attracting world-class expertise from global financial centres as well as helping to foster and develop the necessary skills and expertise locally. Developing, attracting and retaining top talent requires a clear strategy to identify gaps and communicate the benefits of both pursuing a career in the financial sector and living in Alberta.

Appendix C Task team update – manufacturing

Sector profile

Alberta's manufacturing subsectors include a large number of small businesses, with more than 80% of firms in the industry employing fewer than 50 people. Much of the sector does business within Alberta only; however, there are some large firms and successful export businesses. For companies selling their products and services outside of Alberta, the typical customers are in resource-based industries. For the competitiveness initiative, the mandate of the manufacturing task team includes: primary and fabricated metal manufacturing, machinery manufacturing, transportation equipment manufacturing, computer and electronics manufacturing, and electrical equipment appliance manufacturing.

Summary statistics

	2005	2006	2007	2008	2009	Average
Revenues (in billions of dollars)	13.8	16.3	15.7	16.8	12.1	14.9
# of Employees (thousands)	47.2	51.4	51.6	53.7	41.4	49.1
% of GDP[1]	2.8	3.1	2.9	2.9	2.3	2.8
Value of Exports (in billions of dollars)	5.1	6.2	7.7	7.9	5.8	6.5

1 Excludes Primary Metals (no estimates available)

Areas of competitiveness focus

Alberta's manufacturing sector has a number of competitive advantages in place, including access to strong markets in Alberta's energy sector, a talented labour pool, and emerging export opportunities to conventional and heavy oil and gas markets. The manufacturing sector also faces considerable challenges, such as relatively high labour and materials costs, difficulty achieving sufficient scale to compete for larger projects, slower development and deployment of innovation and productivity improvements, and the rising Canadian dollar.

Benchmark data - productivity growth for industrial and technology manufacturing sector 2002-2007 (annual % change[1])

1	Texas	8.2%
2	Finland	7.5%
3	Alberta	4.8%
4	Norway	3.0%
5	Saskatchewan	2.2%
6	British Columbia	2.1%
7	Ontario	1.4%

1 Percent change in real GDP per hour worked in 2002 of domestic currency

Due to the creation of new global supply chains to service the oil sands projects in particular, Alberta's next cycle of opportunities in manufacturing are at risk unless the sector can improve its ability to compete with international companies that are offering replacement products at lower prices. Simply put, given the complexity of the factors they are facing, the best way forward for Alberta manufacturing firms is to markedly improve their productivity and innovation rates.

Productivity and innovation support

In the manufacturing sector, the latest data from Statistics Canada shows that Alberta manufacturers invest less on Research and Development (R&D) per dollar of GDP than their provincial counterparts. Moreover, as a share of manufacturing employment, relatively few manufacturing employees are engaged in R&D activities in Alberta compared to other provinces.

In order to effectively integrate their products into emerging value chains, Alberta manufacturing firms will need to adopt global productivity practices. It is reported that approximately only 2% of Alberta companies have implemented LEAN, an industry standard production practice focused on lowering costs and adding value. This compares with 7-8% in Canada overall and 30% in the United States. Moreover, while many manufacturers perceive the need for process improvement, many Alberta companies may not be fully aware of the resources and supports available to enhance their business through investments in innovation and improving productivity (such as LEAN services).

Fiscal and regulatory environment review

In manufacturing, regulations may not always keep pace with leading manufacturing methods. In some cases review and approval processes, forms, and technical standards can become redundant due to technological improvements. In other cases, regulations can have unintended consequences which result in additional costs, put firms at a competitive disadvantage, reduces revenues, or increase opportunity costs. Fiscal policy and regulations were seen by some manufacturers as constraints or barriers to product development and overall flexibility.

Manufacturing workforce

The sector's productivity challenges are compounded by impending skills and labour shortages, which drive up the price of labour and therefore increase the cost of producing goods and services. Labour shortages are being driven in part by sheer demographic pressures; however, Alberta manufacturers face the additional challenge of competing for labour with the oil and gas industry.

New technologies and production techniques are also changing the face of modern manufacturing. Increasingly, workers are required to have higher skill levels to perform increasingly complex tasks using new types of machinery. Having well trained managers, technicians, skilled trades people, and engineers within this sector is a significant concern within the sector.

Appendix D Task team update – petrochemicals

Sector profile

Alberta is Canada's largest manufacturer of petrochemicals. The current petrochemicals industry in Alberta adds value to natural gas liquids by processing and upgrading them into products that can be used to manufacture a variety of end-use materials. The Alberta petrochemical industry includes four major facilities that have a combined annual production of four million tonnes of petrochemical products. The industry is reliant on natural gas based ethane supply as a feedstock for its operations. Current demand for ethane in Alberta to support the petrochemical industry is approximately 270,000 barrels per day.

Summary statistics

Publicly available statistics on petrochemicals are reported as part of the "oil and gas based manufacturing sector" in Canada. This sector includes various types of petrochemicals, specialty chemicals, plastics, rubber products, and refined petroleum products from crude oil refining. The table below provides a high level overview of Alberta's manufacturing sector (as defined above) and its contributions to the provincial economy. However, for the purposes of the Competitiveness Initiative work, the Task Team has focused primarily on the petrochemical and chemical sectors.

Summary statistics

	2005	2006	2007	2008	2009	Average
Revenues (in billions of dollars)	27.3	28.5	29.3	32.2	22.6	28.0
# of Employees (thousands)	19.7	18.8	19.4	17.9	17.8	18.7
% of GDP	2.9	2.7	2.6	2.4	2.1	2.5
Value of Exports (in billions of dollars)	7.8	8.4	8.7	9.7	6.8	8.3

Benchmark data

Two factors crucial to the competitiveness of the petrochemical industry are:

- Ethane feedstock price and ethane supply availability. For the ethane price in Alberta, this means the price the petrochemical industry must pay for ethane in the province compared to supply in the US Gulf Coast (USGC) which is Alberta's competition for petrochemical development. The following table provides a recent history of ethane prices in Alberta compared to the USGC market.

Benchmark Data

Annual Average Ethane Prices (US cents/US gallon)

	2005	2006	2007	2008	2009	Average
Alberta	53.0	47.7	49.6	60.6	33.1	48.8
USGC	62.1	65.5	78.4	91.2	44.3	68.3

Ethane Volumes (bpd)

	2005	2006	2007	2008	2009	Average
Ethane extracted in Alberta	254	257	251	223	222	241.4
Capacity to consume ethane in ethylene production in Alberta	270	270	270	270	270	270.0

- In the USGC, petrochemical producers have considerable flexibility to choose among feedstock supplies that include ethane, propane, other natural gas liquids (NGLs), or products produced from crude oil, depending on the relative prices for these feedstock options. Alberta's petrochemical facilities are quite different as they have been designed for ethane feedstock which has lower capital cost and better conversion efficiencies. However, these advantages are not realized when ethane is in short supply as has been the situation in recent years.

Areas of competitiveness focus

Alberta's petrochemical industry enjoys a significant advantage over the USGC, based on world scale facilities, access to low cost ethane and modern efficient infrastructure. However, there are challenges ahead. New shale gas developments in the US provide USGC producers access to a competitively priced feedstock with significant expected supply opportunities. In comparison, Alberta's petrochemical producers are faced with a declining availability of ethane feedstock due to demand for Alberta's natural gas in the US dropping because of the shale gas investments occurring. This change in demand means less gas is being exported, resulting in less ethane being extracted for the petrochemical industry.

- Industry's role is to seek out and make investments in new feedstock supply. Options may be available to Alberta producers to capture more ethane supply to support local operations. One option is to import ethane from the northern US into Alberta.
- Another option is to extract more of the ethane that is available in conventional natural gas in Alberta that is currently being sent to industrial operations to be used as a fuel. However, the challenge in this option is that additional extraction facilities are required throughout the province in order to extract the ethane from the rich natural gas streams to be used for feedstock before the gas is used as a fuel source.
- The third option is to source feedstock from the off-gases produced during the upgrading of bitumen from Alberta's oil sands into synthetic crude oil. Bitumen off-gas streams are today mostly burned as fuel at the oil sands facilities but they are very rich in natural gas liquids that would benefit the petrochemical industry. An additional benefit of processing the off-gases is a reduction in greenhouse gas emissions at the oil sands facilities.

The task team is also looking at the current regulatory framework to ensure it enables the optimal development of energy resources.

Appendix E Labour productivity by industry

To provide further detail supporting the selected sectorial productivity information for Canadian provinces presented in Chapter 3, the following tables include productivity levels and growth rates for the provinces, by major industry group.

Labour productivity levels and growth rates by province at the two-digit industry level

Dollars of output per hour, 2007 (expressed in 1997 dollars)

	Alberta Rank	Alberta	BC	Sask.	Manitoba	Ontario	Quebec
Market Sector (all industries)	**1**	**39.4**	**32.5**	**35.4**	**31.4**	**37.3**	**35.6**
Agriculture, Forestry, Fishing and Hunting	2	29.7	38.8	23.5	22.1	20.2	29.2
Mining, and Oil and Gas Extraction	4	75.2	90.9	94.6	100.5	48.2	47.5
Utilities	2	182.8	217.9	176.1	102.2	110.3	163.3
Construction	1	39.8	23.8	29.4	27.8	30.5	38.6
Manufacturing	1	57.1	46.2	41.6	33.6	50.8	46.4
Wholesale Trade	5	38.8	39.4	48.6	40.1	46.5	37.7
Retail Trade	1	25.5	21.6	20.2	23.5	22.6	21.4
Transportation and Warehousing	2	36.4	34.7	38.1	29.6	31.1	29.8
Information and Cultural Industries	1	87.6	69.6	59.7	70.6	66.8	63.8
Finance, Insurance, Real Estate, Renting, Leasing	1	75.7	65.5	66.9	69.0	71.9	68.1
Professional, Scientific and Technical Services	2	28.6	23.4	22.4	18.3	29.1	26.3
Administrative and Support, Waste and Remediation	1	21.9	15.3	18.0	18.7	20.9	21.2
Arts, Entertainment and Recreation	5	12.8	12.0	14.1	16.8	18.9	18.9
Accommodation and Food Services	1	16.6	14.8	12.6	12.7	13.2	13.3
Other Services (Except Public Administration)	3	16.4	16.4	18.5	16.4	16.1	17.2

Compound Annual Growth Rate, 1997-2007

	Alberta Rank	Alberta	BC	Sask.	Manitoba	Ontario	Quebec
Market Sector (all industries)	**6**	**1.0**	**1.2**	**2.1**	**2.1**	**1.7**	**1.8**
Agriculture, Forestry, Fishing and Hunting	1	7.3	1.7	4.7	4.9	3.0	3.8
Mining, and Oil and Gas Extraction	5	-4.3	0.5	-4.7	6.1	-4.1	0.1
Utilities	4	-1.4	2.1	0.7	-2.7	-0.9	-1.5
Construction	1	3.0	-0.7	1.0	2.1	1.7	2.2
Manufacturing	4	2.2	2.9	0.1	0.9	2.4	2.4
Wholesale Trade	6	2.7	4.0	3.9	3.2	4.2	3.4
Retail Trade	1	4.9	2.9	4.0	4.3	3.1	2.9
Transportation and Warehousing	2	1.3	1.0	2.3	0.4	0.2	0.4
Information and Cultural Industries	1	5.3	4.2	4.1	3.3	2.7	1.3
Finance, Insurance, Real Estate, Renting, Leasing	2	2.0	1.1	3.9	2.0	1.5	1.1
Professional, Scientific and Technical Services	2	1.8	0.5	2.0	-0.8	1.5	1.4
Administrative and Support, Waste and Remediation	4	0.8	-2.5	1.7	2.0	0.6	1.1
Arts, Entertainment and Recreation	4	-2.2	-3.9	-3.8	5.7	-0.2	-0.4
Accommodation and Food Services	1	2.4	0.5	0.9	0.4	0.5	1.7
Other Services (Except Public Administration)	4	1.9	1.3	3.7	2.8	1.5	3.3

Source: *New Estimates of Labour, Capital & Multifactor Productivity Growth and Levels for Canadian Provinces*, Centre for the Study of Living Standards, Appendix Tables 1 and 3.

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